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A NEW TYPE OF SOUTHWESTERN RUIN

IN my studies of ruined rooms and dwellings constructed by the prehistoric Indians of Arizona, I have found several examples that cannot be satisfactorily referred to any of the several types from that state recognized by students of these habitations. Some of these constructions are well known and have been grouped with the so-called cavate lodges or artificial excavations in the sides of cliffs, which, it must be confessed, they resemble in some respects. Many are situated on top of cliffs and are naturally, from their position, called cliff-dwellings. The majority, however, are not in cliffs but in the plain, excavated below the surface in a broken country, when they are often sheltered by protruding rocks of low altitudes. Those that are situated in these localities are neither pueblos nor cliff-houses, being without structural affinity with any rooms constructed in relief or above ground. It has seemed to me that the closest relationship of these rooms to known ruins is with a group of underground constructions called by archæologists "pit-dwellings," a type hitherto not sufficiently differentiated from other prehistoric dwellings in the Southwest.

The structure of the simplest form of Arizona pit-dwelling has affinities with other examples of this type widespread in the Old and New Worlds. Pit-dwellings may be defined as excavations in rock or earth, having a vertical entrance through a roof that is level with the surface of the ground or slightly raised above it. The bounding walls of such rooms are constructed of clay or may be formed of masonry which does the double duty of supporting the beams of the roof, and forming the walls of the

dwellings. In pit-dwellings where the plastering is not applied directly to the wall of the excavation, upright logs with osiers woven between them form the support of clay plastering, thereby strengthening the structure and preventing the caving in of the ground in which the room is excavated. Ordinarily the simplest form of pit-dwelling is a hole in the earth forming a chamber that may possess mural banks or niches, but the more complicated examples have side entrances opening from the main pit into secondary smaller rooms. From necessity external entrance into a pit-dwelling is through the roof and is accomplished by means of notched logs or ladders. In a pit-dwelling of this simple kind the firehole consists ordinarily of a depression in the middle of the floor situated under the entrance into the room, which serves for the exit of the smoke. In the more complicated examples this fire-place is in one corner, and has a special vent in the roof above, for the passage of the smoke.

The essential and important structural difference, from a classificatory point of view, between cavate lodges and pit-dwellings was recognized over 10 years ago in my report,¹ on certain caves near Flagstaff, Arizona, although at that time the word pit-dwelling was not used to designate the latter. A recent examination of ruins, similar in form to those near the San Francisco mountains, in the Little Colorado valley, confirms my belief that this designation should be adopted and would be advantageous to future students of the antiquities of Arizona.

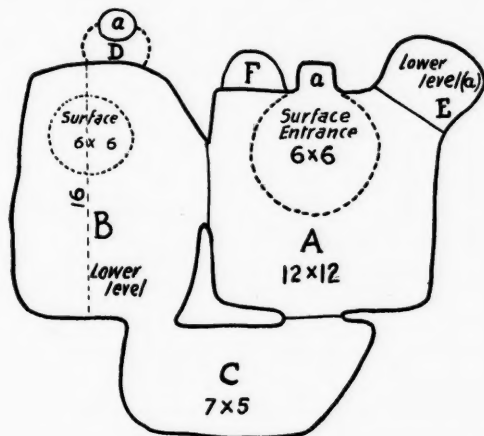
As one descends from the great lava flows and cinder beds which cover the country on the north and east sides of the San Francisco mountains, and emerges from the belt of pines and cedars into the deserts bordering the Little Colorado, he encounters a treeless zone where the rock foundation underlying the lava is mainly red and white sandstones. At intervals there rise out of the ground low hills—remnants of a superficial formation that has survived the great erosion, evidences of which are everywhere conspicuous. These elevations, seldom more than 20 ft. high, are often crowned with ruins of old pueblos, examples of which are especially abundant near the Black Falls. Between them are situated canyons and plains, the beds of the former, often level, being made so by deposits of earth, cinders and soil, furnishing suitable sites for excavated pit-dwellings. These subterranean rooms are often accompanied by ruined walls which sometimes rise several feet above ground. A common form of these pit-dwellings consists of a series of rooms or several subterranean chambers arranged along the base of a low elevation,² the rocky sides of which form a shelter for the entrance into the subterranean dwelling. A close examination will reveal the fact that almost every ruin in this region is accompanied by several of these pit-dwellings situated at the base of the low elevations on which the ruins stand. Another and the most numerous form of the type is unaccompanied by any ruined walls above ground, but is simply a row of pit-dwellings generally in the lee of a low cliff which served to protect the entrances from wind and sandstorms. At one place in this locality as many as 13 of these pit-dwellings were found arranged in a row, side by side,

¹ *Twenty-second Annual Report, Bureau Amer. Ethnology.*

² The Turkey-Tanks caves closely resemble in some respects the pit-dwellings at the Black Falls.

there being no vestiges anywhere of accompanying walls above ground. Each room in such a cave is now full of fallen rocks and soil, especially drift sand, so that only the tops of the wall are seen, indicating that the buried chambers were rectangular, with rounded corners, or circular in form. From the great number of these pit-dwellings near Black Falls it seems probable that they occur elsewhere along the Little Colorado.³

A more complicated form of pit-dwellings known as the Old Caves occur in the lava beds or on an elevation marking the rim of a very much eroded volcano about 12 miles from Flagstaff, Arizona. These caves, sometimes designated Coconino caves, have been known for many years and have been repeatedly described by travelers and archæologists. By a majority of writers they are classified as cavate dwellings, being asso-



PLAN OF PIT-DWELLINGS—OLD CAVES

ciated with this type so well represented elsewhere in New Mexico and Arizona. A comparison of these structures reveals the fact, which a scientific study confirms, that there is a marked structural difference between some of these caves of the Flagstaff region and cavate dwellings of the Verde Valley or even with the so-called New Caves, not far away. This difference is primarily in the position of the entrances. Both forms are artificial excavations in volcanic formations, but while in the Old Caves the entrances are from above, those of the New Caves, as in the Verde Valley, are from the side. On this account the Old Caves are regarded as belonging to the new type or pit-dwellings, well represented, as we have seen, near the Black Falls. The Old Caves are situated on the summit of a lava hill, quite precipitous on the sides, and are excavated in a lava conglomerate which could be very well worked with stone implements. They are prehistoric or at all events were uninhabited when first visited by white men.

³ The general resemblance in objects from cave and pueblo ruins to those found near these pit-dwellings would indicate a similarity in culture, but the significance of that likeness has not yet been carefully investigated.

When we examine the flat top of the hill in which these pit-dwellings have been excavated we find ourselves in the midst of a number of broken down walls rising in places several feet above the surface. These walls are constructed of lava blocks roughly hewn and laid in the form of rudest masonry. By a little study we are able to trace out a number of rectangular enclosures arranged side by side in rows at varying levels, forming terraces, the whole assemblage having a ground plan not unlike a checker board. In certain places some of the component squares are larger and more irregular than the others, their shape suggesting courts or plazas. Many of the enclosures are found to have a hole in the middle of the floor which passes to an excavation below. This hole is the entrance through which one can pass into a pit or subterranean chamber larger than the entrance, which communicates with secondary rooms through lateral openings. There are small openings, in addition to the entrance, in the roof of the pit which served for ventilators or chimneys. Passing through this narrow hatch-like entrance into the enlarged pit-dwelling we find ourselves in a room often showing signs of plastering, having a floor and fire-place, and in one or two instances remains of a bank on one side. In the walls of this subterranean room there are openings leading into other smaller chambers showing the existence of not one but several chambers, or a suite of rooms so to speak, opening into the pit, the main entrance to which is from the roof, the 2 passages into the other rooms being lateral. In many instances this vertical entrance has now lost its likeness to a hatchway, having been enlarged by breaking of the floor which has filled the room with fallen rocks, so that the original pit entrance is no longer recognizable. In others, however, the hatch is still unbroken and the roof of the subterranean room is intact.

From this superficial account of the construction of the typical pit-dwelling shown in the Old Caves we may pause for a moment to consider the probable conditions when they were inhabited. On the summit of the lava hill was a series of low one-story buildings arranged in series, many of the rooms with openings in their floors through which one could pass to subterranean domiciles by means of a vertical passageway. Whether these walls above ground had roofs and enclosed rooms is not evident. There is some evidence that they had, and at all events we can rightly suppose the people used the enclosures for various household purposes; their walls no doubt served for defense. There can be no question that the cellars under these enclosures were sometimes inhabited and were not simply storage places. If they were inhabited the presence of a roof on the walls above ground would certainly greatly obstruct needed light for which the fire in the fire-place was inadequate.

A comparison of one of these pit-dwellings with the main room of the New Caves shows few differences save one which is destructive, viz: the possession of a vertical entrance and surrounding wall of the pit-dwelling in one case and of lateral entrances in the other. I am inclined from this and other reasons to regard these two forms of cavate dwellings as contemporaneous, or, in other words, we have here as in all artificially excavated rooms, one, the pit-dwelling, dug down from the surface, the other dug into



TURKEY-TANKS CAVES, ARIZONA



NEW CAVES—CAVATE DWELLINGS NEAR FLAGSTAFF, ARIZONA

the side of a cliff. The latter type may well be a cliff-dwelling, and the former happens, in this instance, to have been excavated on top of a cliff. This position not being essential for its construction, it is not necessarily a cliff dwelling, or even a cave-dwelling; unless we call a hole in the ground a cave. It answers the requirements of a pit-dwelling belonging to a group widely distributed in different regions of the earth.

We find that examples of this new type of ruins are not confined to prehistoric Arizona but occur in several localities in New Mexico, and I predict renewed exploration will bring to light many more, for they appear to be widely distributed.

The pit-dwelling type appears to be a very old one in America and is found in California and on the west coast of North America. Nor are pit-dwellings confined to the plateau region of the United States, but have counterparts on the plains east of the Rocky Mountains even in modern Indian life.

The Arizona pit-dwelling seems to have been abandoned as a habitation in prehistoric times, but many survivals of them exist even in pueblos still inhabited. These survivals are archaic ceremonial rooms known as kivas.⁴

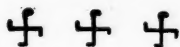
In conclusion it may be well to enumerate the different architectural types of prehistoric buildings that have been recognized in Arizona. The most extensive of these are the Compounds or Great Houses of the Gila-Salt rivers and their tributaries, the typical form of which is a massive block or blocks of buildings surrounded by a wall as in Compound A of Casa Grande. This type, sometimes confused with a second type, the puebloan, is radically different from a pueblo of either Hopi or Rio Grande agriculturalists, and is accordingly designated by a distinctive term. The pueblos whether free in the open or situated on top of a talus backed by a precipice or protected by the roofs of natural caverns illustrate a clearly defined

⁴ The structural character and relationship of the pit-dwellings of the Little Colorado will be amplified in a comprehensive article on the "Antiquities of the Little Colorado" which is now in preparation my purpose for the present being to call attention to this new type.

type, which merges sometimes into dwellings artificially excavated in the sides of cliffs. Artificial caves form a third type which includes cavate dwellings or cavate lodges. The distinguishing structure of the simplest type of pit-dwellings is their subterranean position and consequent roof entrance, as indicated above. This form is the subterranean counterpart of the building above ground, and its walls, like its representation in relief, may be of stone or of more fragile construction, both of which are found among prehistoric habitations. The majority of ruined habitations in Arizona, excluding Navaho and Apache *hogans* or such structures as Pima dwellings called *kis* and other like structures, may thus be referred to one of four types: (1) Pit-dwellings; (2) Cavate dwellings; (3) Pueblos; (4) Compounds. These, like all types, are sometimes pure, but more often mixed; examples found in different regions showing composition of several in one and the same community building. Thus the puebloan type may occur in the open, on mesa tops or talus slopes, with or without artificial caves below or behind them, or they may be situated within natural caves. They may possess one or more excavations of the pit-dwelling type, among the component rooms, but morphologically the radical differences existing among these four types can be readily recognized, even when combined.

J. WALTER FEWKES.

Washington, D. C.



GREEK RELICS IN RHODESIA.—It is said that Doctor Carl Peters reports finding for the first time definite first-hand traces of the presence of the ancients of classical and preclassical times in the gold mining districts of South Africa.

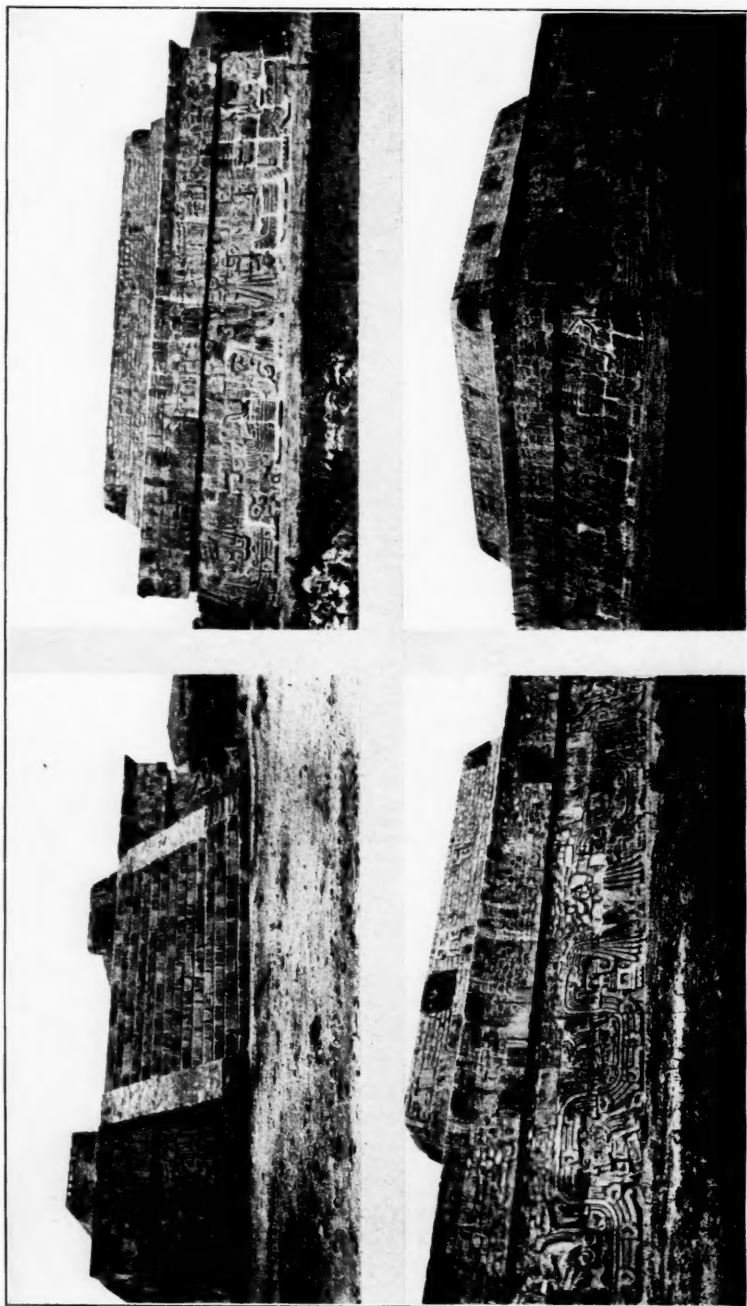
The New York *Times* quotes him as saying:—

The tablet in question was found by one of my men in a slave pit to the south of Inyanga, north of Umtali, (Rhodesia). The district contains hundreds of these pits, from 20 to 25 ft. deep, in which the ancients kept their slaves. The tablet was evidently made of cement, and had been cut in two, clearly while it was soft, the letters on it being in no way damaged.

The characters look to me like Greek letters, but other experts say they are Graeco-Phoenician. I take the tablet to be the half of an ancient passport, one portion of which was retained by the master and the other handed to the messenger.

I also discovered, near Zimbabwe, a brass figure of Pan, 6½ in. long, very similar to the figures found at Pompeii, thus proving Greek influence in South Africa apparently at a later period than the tablet I spoke of. These and other discoveries are to my mind further proof that in South Africa there has been a continuation of different ancient civilizations.

It has also been shown that during all these periods gold mining was carried on. Apparently this was begun by natives of the soil, probably Bushmen, and it seems likely that the first Semitic people who appeared on the scene were only traders in the precious metal.



FRONT VIEW OF THE RESTORED TEMPLE OF THE
PLUMED SERPENT

REAR VIEW OF THE TEMPLE OF THE PLUMED SERPENT
AS RESTORED

SOUTHERN FACE OF THE TEMPLE OF THE PLUMED
SERPENT

EASTERN AND NORTHERN FACES OF THE TEMPLE OF
THE PLUMED SERPENT

XOCHICALCO

ABOUT 18 miles south of Cuernavaca at an altitude of 4000 ft., lies the ancient "Hill of Flowers,"—Xochicalco,—crowned by the ruins of the same name which at the present time the Mexican Government with laudable motive but doubtful result, is beginning to restore under the direction of Señor Leopoldo Batres.

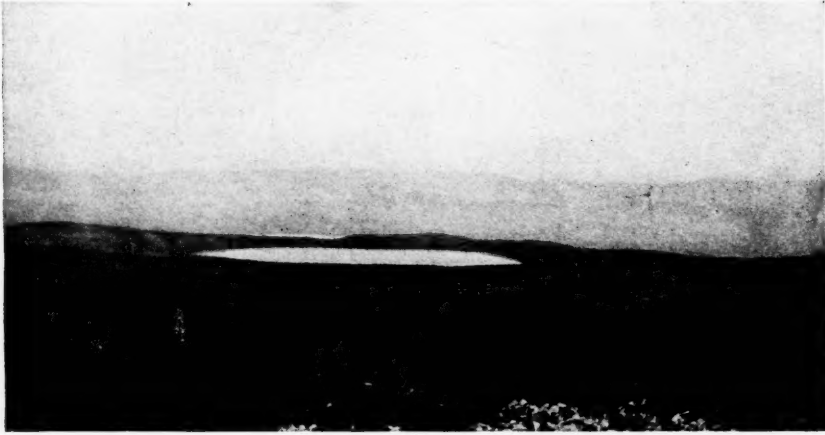
The surrounding country is seamed by great barrancas and strewn with loose volcanic rock, which in the absence of anything that could be called a road, fortunately make the approach somewhat discouraging to the predatory tourists of to-day who descend in hordes upon Cuernavaca. Hence it is that although only a short distance from this point, the ruins are comparatively infrequently visited though widely known.

The valley in which they are situated, surrounded by its great chain of mountains, is in reality the first of a series of giant steps leading downward from the Mexican plateau to the Pacific littoral. Partially across its median line running from east to west extend a number of low mountains in a break of which lie two adjacent hills from 300 to 400 ft. in height. Upon the summits of these the main ruins are found, the lower or most westerly hill containing the largest and by far most important remains. About 3 to 4 miles distant rises the eastern escarpment of the transverse line of mountains, around whose summit extends a great terrace, undoubtedly of artificial origin, though concerning the ruins, which its presence in all probability denotes, the writer is unfortunately unable to speak, as it was impossible at the time to visit them.

Xochicalco has been principally noted for the bas-relief sculpture that winds its serpentine folds around the sides of the well known temple on the smaller of the two hills before alluded to. This, while of a high order of excellence, to be described later, is inferior to the comprehensive plan and extent of the remains as a whole which frequently have been overlooked in admiration of this one detail.

Standing upon the top of the now reconstructed temple, the view that spreads before the eye is indeed grand and inspiring—far to the north, beyond the red-tiled roofs of Cuernavaca, nestling amid the vivid green of the foliage, lies the great mountain barrier that separates this section from the Valley of Anahuac with its ruins and temples of the cultured Toltecs, the civilized yet blood-thirsty Aztecs, and the other kindred Nahuatl tribes who doubtless poured in ages past through the great gap in the mountains that faces Xochicalco to devastate the fertile fields stretching beyond, which were later to be given by Charles V to Cortez as part of the domains subject to the great Marquis whose prowess in turn had won them for Spain.

To the northeast rises the neighboring hill with a stately roadway approximately 30 ft. in width leading in a straight line to the elaborate temple ruins on its summit; while beyond, across the barrancas towers the terrace-crowned peak that forms a part of this great triumvirate.

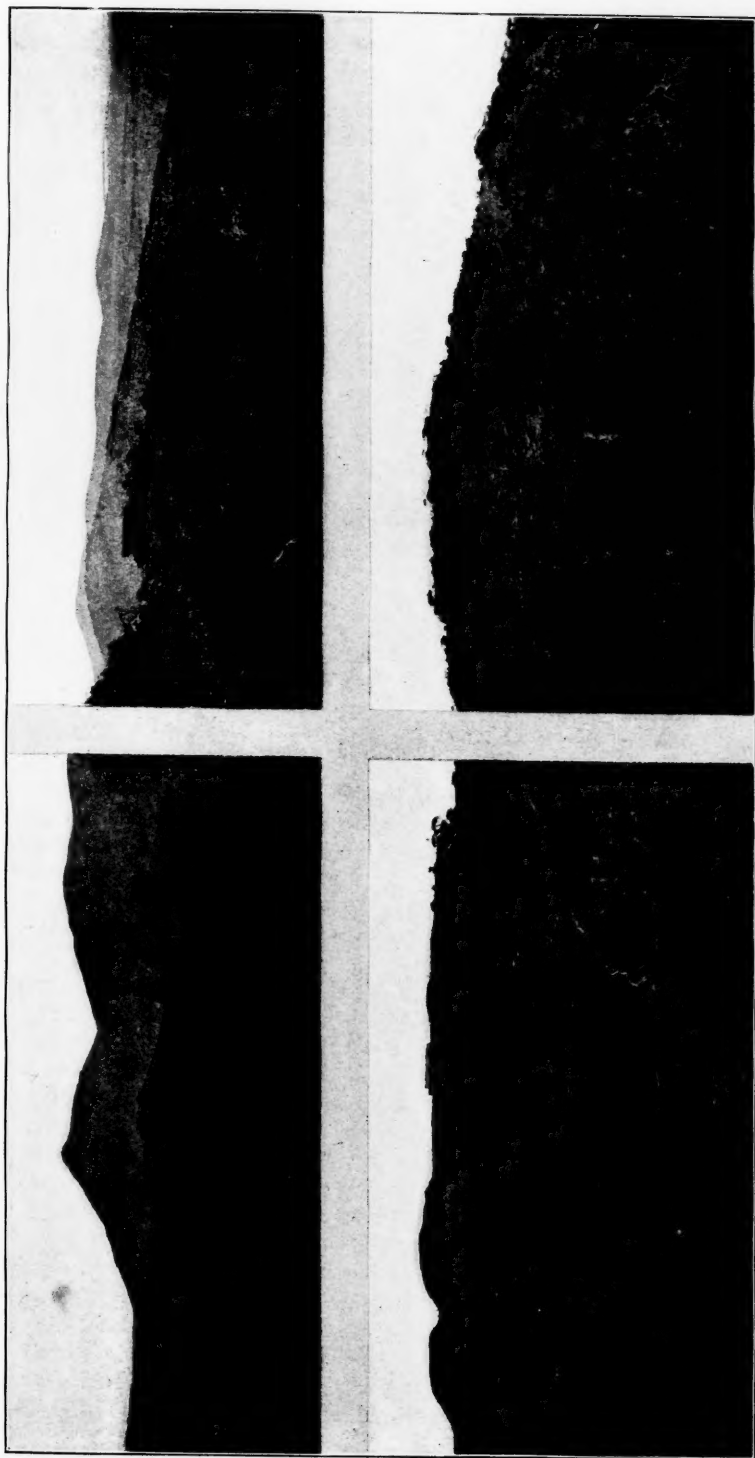


LAKES WHICH XOCHICALCO FACES—NOTE THE TERRACES IN FOREGROUND

Yet it is when we turn to the south that the stupendous scale and full grandeur of Xochicalco dawns upon us, for it is in this direction that the wonderful remains face, falling in a great series of sweeping direct and flanking terraces in the form of a hollow square ever widening as it descends to the lake which sparkles far below, and beyond which at a still lower level can be seen the clear reflections of a second and smaller body of water shining like a jewel in the diadem of the valley's verdure. Far beyond, the rampart of mountains is partially hidden by the purple mists of the distance that gradually blend with the clear blue sky and great white clouds of Mexico.

The terraces testify to a remarkable talent in their makers for what might have been called landscape gardening for the lack of a larger term and by their bold conception and vast size surpass anything of a similar nature that it has been the writer's fortune to view with the exception of the famous ruins on the Monte Alban in Oaxaca. The noted Borda Gardens of Cuernavaca, the palace grounds at Versailles, and the Borghese Gardens of Rome lack not only the superb situation but the imposing grandeur of the time-worn terraces of Xochicalco.

Such is in brief an outline of the scenic setting of these ruins which forms such an integral and important part of the whole, and without a due consideration of the prominence thereof in the minds of the original builders, and the manner in which their structures were adapted to and harmonized with it, we can form but a poor conception of their work. Unfortunately, in this respect it surpasses anything that we ourselves have as yet attempted. The western hill, containing, as before stated, the most important remains, is cut on the north by 4 terraces,—portions of which at least were faced with stone while the lower one was apparently originally surmounted by a stone wall,—the problem of military defense having been duly considered and given a place of prominence in the general plan of the



THIRD HILL WITH TERRACED SUMMIT FROM THE MAIN RUINS
 RUINS ON SMALLER HILL FROM ROADWAY ON ADJOINING HILL
 —SERIES OF PLATFORMS TO THE LEFT

FLANKING TERRACES ON SOUTHERN SIDE OF SMALLER HILL
 VIEW OF LARGER HILL FROM THE SMALLER WITH ASCENDING
 ROADWAY



FIRST TERRACE BELOW SUMMIT TO THE EAST—SMALL HILL

ruins. One of the upper terraces partakes somewhat of the nature of a ditch and was faced with rough masonry.

To the east the hill drops at an angle of about 60° to a terrace 20 ft. below, along whose eastern edge stand three isolated mounds beyond which it descends in a series of terraces to a square platform facing the saddle connecting the two hills. The grand causeway begins here, having been probably reached in early days by a monumental flight of steps. Then crossing this connecting ridge it leads upward to a somewhat similarly situated platform which it surmounts by dividing into two parts and ascending on either side, after which it again unites into a grand walled pathway, paved with smooth blocks of stone and sweeps upward in a direct line to the temple-crowned summit. Here it entered apparently through a gap in the wall into a great court surrounded by walls of loose masonry, while to the east in a series of gradations the remains arise to be finally surmounted by a small truncated pyramid which faced the cardinal points and was capped by a very limited cement platform. From this center the lower terraces fall regularly to all sides except the west to which the extra terraced court was added to meet the ascending roadway.

The general plan of these ruins like that of those on the neighboring hill faces the south.

The view from here in the days of Xochicalco's glory must have been superb, as it commanded not only the fertile valleys but the walls, terraces and temples that spread below on the summit of the sister hill, including the notable shrine that has done so much to give these ruins their principal fame. For though small in size—about 65 ft. on the east and west by 58 ft. on the north and south—its receding sides are nevertheless decorated with an exceedingly fine order of bas-relief in the form of what might be called, for the lack of better nomenclature, a great plumed serpent, though its

head undoubtedly partakes more of the lines of the conventional Chinese dragon than that of any known species of reptilian life. There are 2 of these designs to each of the 4 faces of the basic platform, the head of the serpent being at the corner and pointing inward with projecting tongue which is extended horizontally in the case of the ones on the front of the temple, and is dropped to a vertical position in the ones on the sides and back. The plumed tails lie towards the middle and are separated by two parallel lines with a cross work pattern between, except on the front of the



DETAIL OF DESIGN ON FRONT FACE OF THE TEMPLE

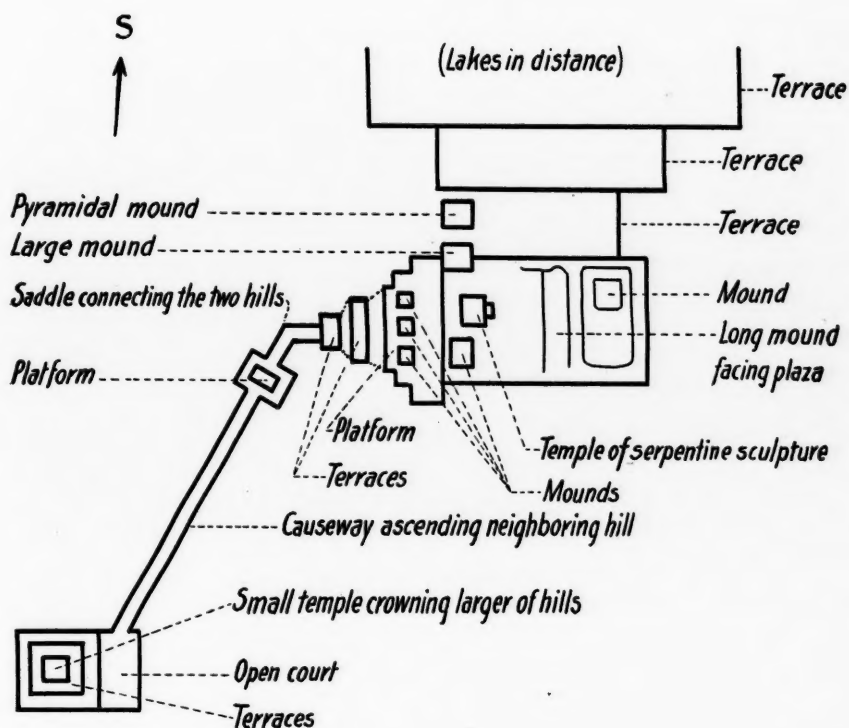
temple where they bend in a great circle until opposite the mouth, while a seated Indian with disproportionately large headdress and a bold profile is seated with legs crossed at intervals among its folds, and occurs on a smaller scale in the frieze. The forehead is receding if not flattened, the shoulders square and the waist line tapering. Necklace, ear pendants, bracelets and anklets are all in evidence and are of a striking and elaborate



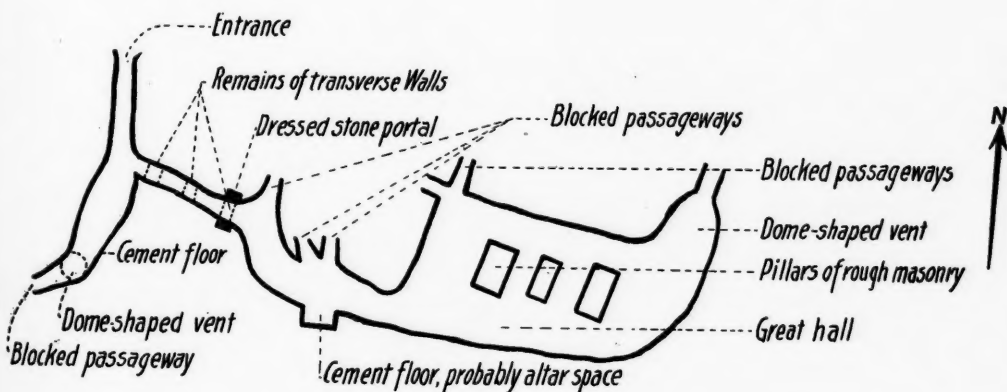
STRUCTURES IN THE MODERN PUEBLO OF KOCHICALCO—NOTE THE CONTRAST TO THE ANCIENT STRUCTURES

nature—while opposite the face appears a hieroglyphic design. The figures on both sides face the west or front of the temple and number two to each serpent or four to a side. On the back there are but two, each facing the head of the design which contains it—*i.e.*, one to the north—the other to the south.—On the front there are none. At intervals throughout the carvings hieroglyphic characters occur, but these are especially numerous on the frieze and seem to have been largely of a chronological nature. There is some similarity between these and the Mayan glyphs to the South, but many are apparently of a totally different nature,—and like the great serpents in a class by themselves,—while the seated figures display a strong resemblance in position and poise to a figure engraved in chalehinite from Ococingo—and in profile, the style of the bracelets, anklets and necklace to the well known carvings of Palenque.

In front the serpentine folds are arranged and shortened to admit of a flight of steps that leads to the summit of the platform which, as restored, is enclosed about 2 ft. from the edge by a wall 4 ft. high with a perpendicular inner face and an outer one sloping at an angle of about 73° to harmonize with the carved walls below. Nearly all of the early writers including Humboldt, Alzate and Dupaix noticed the remains of what was probably a paint or varnish of a deep red color that was supposed to have formerly covered the sculptures. This, however, was not visible to the writer. The stonework is exceedingly well executed and of an admirable finish except where the hand of the restorer is in evidence, and was laid in courses with well squared corners—the designs being carved over the surface of the wall after its completion. Many of the stones, which seemed to be basaltic in their nature, are of a very large size and could only have been brought from their original quarries and worked by a people well advanced



PLAN OF THE SUMMIT RUINS OF XOCHICALCO



PLAN OF MAIN SUBTERRANEAN ROOMS AT XOCHICALCO



SINGLE SERPENT DESIGN ON SOUTH FACE OF THE TEMPLE

in civilized arts. A further description of the temple is useless as the photographs will clearly show the design and details.

To the right and left of this ruin are mounds which probably were formerly temple platforms faced with stonework of a lower order, judging from the glimpses the writer was able to obtain of it. However, there has been practically no excavation upon these, so it is nearly impossible to correctly judge of their exact nature and design, or whether they contain carvings of any extent. Opposite this row, on the western side of the inclosed plaza which measures about 275 ft. by 325 ft., is a long mound quite a little higher, and upon which a frame house with a stone addition has been erected by those in charge of the restoration—striking evidence that no work is contemplated in that locality in the near future. Back of this the hill rises and more mounds are in evidence.

To the south another mound faces a portion of the plaza which here falls away, as explained, towards the lakes. At quite a distance to the west upon the summit of a small outlying hill are the remains of another structure, while from one-half to three-quarters of a mile to the north a number of mounds are grouped upon a gentle swell in the valley's floor,—all that remains to-day of a probable village site.

One of the most interesting features is undoubtedly the subterranean passageway under the main group of ruins. About one-third of the distance down the northern face of the hill an opening leads into a chamber evidently cut out of or enlarged in the friable limestone rock which composes the body of the hill. From this lead two passageways—one ascending in a southwesterly direction for about 30 or 40 ft. and then turning to the right where it apparently ends. There is here a portion of a cement floor in evidence, and at the point where the excavation terminates its southwesterly course an air shaft rising from a cupola, neatly lined with rough masonry,



SEATED FIGURE ON THE NORTHERN FACE OF THE TEMPLE

ascends apparently to the surface. The other passageway turns in an easterly direction and passes through 3 stone walls that extended across it, evidently with the intention of barring the intruder's progress, and enters a larger space the general direction of which is southeasterly, bending more sharply towards the east at the end, and in its latter half swelling to the proportion of a large hall. This contains 3 great pillars of roughly laid irregular blocks of stone, the largest column measuring about 15 ft. by 8 ft., and displays a roof that at the present writing is of an exceedingly treacherous nature. There are in all 6 passageways branching off of this main hall and its extensions—4 to the north and 2 to the east. They have not yet been opened, being blocked with stone at present, but seem to lead toward the side of the hill. The great hall ends in one of the former corridors which diverges at right angles and which is securely filled with masses of rough masonry. At its entrance the roof again assumes a conical form extending upward into another air vent similar to the first one noted. Most of the side walls are faced with undressed stone of a low order, in this particular presenting a sharp contrast to the newly discovered subterranean at Mitla which in general excellence vies with the King's Chamber in the Pyramid of Cheops, and the lower subterranean ruins of Teotihuacan.

Only in one case did the writer note any dressed stone and that was at the point where the corridor opened into what might be termed the narrower part of the great hall. There the portals of the entrance were faced with blocks of well-squared basalt. A small excavation in the west wall nearby looked as if it might have been the site of an altar, especially as one of the passageways branched off immediately opposite. In the plaster in one of these walls the writer found portions of red pottery of an excellent finish and good texture.

Further down the hill is another small and much less important subterranean passage.

The contrast between the low order of masonry displayed in these underground galleries and the high development indicated by the temple of the serpentine carving is striking. The dissimilarity is so great that it would lead one to surmise that the latter was constructed at a much later period, which theory is further supported by its superiority to what we know of the construction, finish and also preservation of the surrounding ruins.

As the purpose of these remains undoubtedly had an important religious bearing the subterranean passageways probably had a similar signification, but the exact purpose of their construction—what lies at their end, and why the ancient inhabitants took such elaborate and laborious means to conceal their existence from future generations, and prevent their exploration, may long remain one of those questions which confronts the archaeologist among the ruins of the New World, and which throws a glamour of romance over the crumbling walls, and hidden sepulchres of their makers.

Whoever were the original builders and whatever their end, we may safely conclude that the master mind or minds who planned the imposing approaches and the brilliant grouping and design of the buildings, and the patient hands that carved the folds of the great serpents have left a monument to their genius and industry which will shine throughout the years as a memorial of their ability in much the same manner as in ages past the sacred fires shone throughout the valleys and the distant hills from the summit of the temples of Xochicalco.

A. HOOTON BLACKISTON.



EXHIBIT OF PROFESSOR GARSTANG'S FINDS.—During the past summer there was an exhibit in the rooms of the Society of Antiquaries [London] of the previous season's work in Nubia by Professor Garstang. His work was at Meroe, where the remains of 4 temples were found. Nearly 80 graves in a large necropolis were excavated.

First to be noted in the exhibit were the life-size statues of an Ethiopian king and queen. They are executed in dark red sandstone, and show a distinctly negro-like type. They are inscribed with hieroglyphs in Meroitic script. Probably they are not older than 200 B. C. There is also the figure of a kneeling captive with his elbows tied behind him which is probably earlier. There are other blocks of sandstone with inscriptions, among them one containing 3 cartouches of Ark-Amen, ar Ergamenes.

There were also many varieties of pottery, varying in size and form from red vases in the form of gourds several yards in circumference to graceful vases hardly thicker than an eggshell, of light buff color, bearing a pattern in ink. There were also a number of grave stelæ, some showing Anubis, Horus or Thoth presenting the dead to Osiris. One torso of a woman strangely resembles Mexican images of similar type.

OPENING OF AN INDIAN MOUND NEAR SIOUX CITY, IOWA

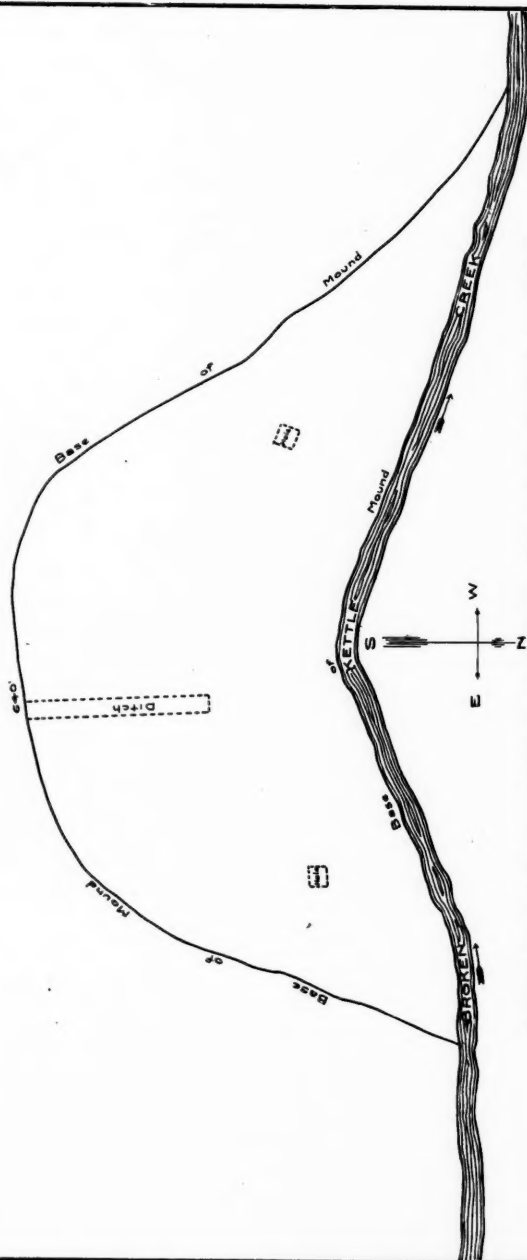
SCATTERED over northwestern Iowa are great numbers of Indian mounds, generally near the rivers and creeks. Most of these ancient earthworks are small, but a few are large. Many small ones were formerly inside the limits of Sioux City, but have been destroyed by grading streets or in building.

One of the largest mounds in this region lies about 12 miles northwest of Sioux City, on the bank of the Broken Kettle Creek which empties into the Big Sioux River, a mile below the mound. Much interest has been felt concerning this mound and its probable contents, by the members of the Sioux City Academy of Science and Letters. In the latter part of September, Mr. A. S. Garretson, a member of the Academy, took a party of men with a tent to the mound and spent 4 days in making excavations. The mound is in the shape of a crescent with the concave side next to the creek and is 360 ft. from point to point, 150 ft. wide and 12 ft. deep in the center. Beginning at center of convex side a trench 6 ft. wide was dug, 75 ft. to the center of the mound, following the natural level of the ground. Two other pits, 6 ft. square were dug down to the level of the ground, each about 40 ft. from the center towards the end of the mound. From these excavations were taken more than 4 bushels of specimens, consisting of broken pottery, bones and bone implements, carvings in stone, flint artifacts and clam shells. No human bones were found in the mound. These objects were scattered at random through the mound. I quote from the report of Mr. Garretson as to the construction of the mound: "Possibly 5 to 10 per cent of the bulk of the mound is composed of such refuse as I have mentioned, large quantities of earth, taken apparently from the bed and shores of the creek. No bluff soil was found in it and no excavation in the valley is apparent from which this earth was taken. I observed that ashes, bones and broken pottery were found in heaps or piles, associated together in quantities of about a half barrel. This circumstance indicates that these materials were brought to the mound from somewhere else."

The building of this mound must have required the labor for many years of large numbers of people who were settled in a village close to this work. All the refuse of such a village, consisting of ashes, bones and broken pottery, was thrown in with the earth required to construct so large a mound as this one. The object of those who built it could not have been simply to dispose of this refuse, but was probably to commemorate some important event, while perhaps some one or more of their chiefs may be buried under the mound. On the bluffs a short distance back from the creek are graves of thousands of Indians whose skeletons have been well preserved in the dry loose soil of the hills.

The pottery found in the mound is similar to that found all over the Eastern and Central States from the Great Lakes to Florida. It is nearly all ornamented with straight or curved lines incised with the point of a

PLAN OF INDIAN MOUND
 IN W. 1/4 OF THE S.W. 1/4 OF SEC. 3 T. 90N. R. 48W.
 SHOWING LOCATION OF EXCAVATIONS MADE BY
 MR. A. S. GARRETSON, SIOUX CITY, IOWA.
 PLYMOUTH CO. IOWA.



Distance from creek around base to creek 640 ft. Distance along creek at base 360 ft. Height at center 12 ft. Erosion estimated to have been 4 ft. which has probably added to the original circumference. Diameter at base, from south to North, 150 ft. Length of open ditch dug, 15 ft., to center. Width of ditch, 6 ft. Two other holes, to original surface 6 ft. sq.

sharp stick or bone while the clay was soft. These lines are nearly always on the rims of the vessels but occasionally the whole surface is covered with them. Some have ears on them through which a bail of twisted grass might have been placed to carry the dish. Many fine bone needles were found that were made from large hollow bones split into numerous pieces and then sharpened on a piece of sandstone, several of these were found. Two specimens of carved stone were found, one the effigy of a bird and the other of a bear. The smaller one, the bird, is 4 in. long, 2 wide and 2 high. The wings are carved in bold relief, with deep lines on each representing feathers. In the back or top are two conical holes, $\frac{3}{4}$ in. in diameter at the surface, bored $1\frac{1}{2}$ in. deep where the holes are about $\frac{1}{4}$ in. in diameter and joined together. These two holes are as near alike as possible and I can see no way in which the object could have been used as a pipe, for there is no way by which a stem could have been attached. The larger of these effigies has these same conical holes in the back and joined in the same manner. This one is made to represent a bear. The hind legs are carved in bold relief with the knee cap in front as in the elephant and bear. It is 3 in. wide, 3 in. high, and $5\frac{1}{2}$ in. long without the head which is broken off. Both these specimens were limestone from the cretaceous rocks about here.

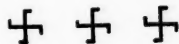
One flint implement is a very fine knife, 5 in. long by $1\frac{1}{2}$ in. wide, with parallel sides, and ends square with the sides. One side of this is beveled on all four edges making a knife edge all around. These three specimens are different from any I have ever seen or read of.

In a dry run near the mound was found a fossil tooth of the large extinct species of horse which in later Tertiary times roamed all over this continent, from Iowa to Florida. This specimen is almost perfect in every detail, and measures $5\frac{1}{2}$ in. in length by $1\frac{1}{4}$ in. square on the grinding surface, tapering very little to the other end. It is curved about 1 in. in its length.

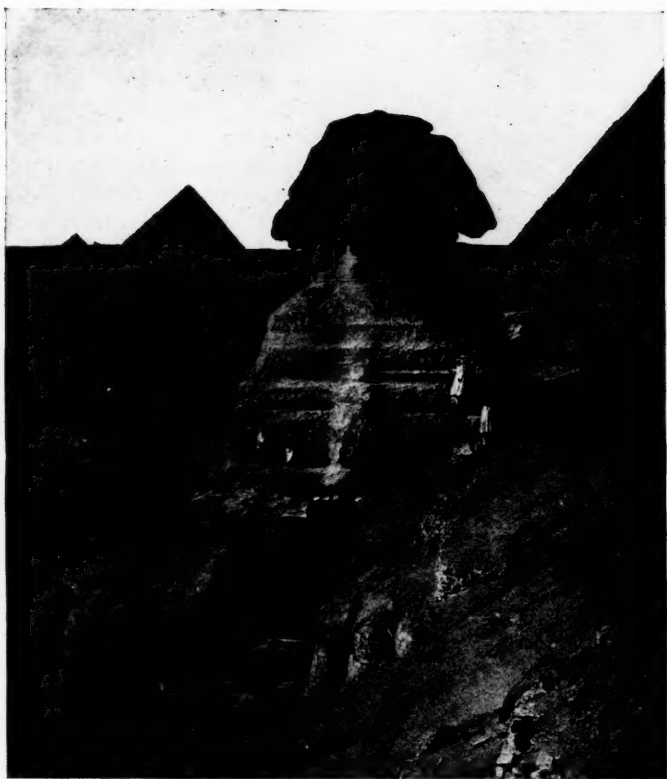
These specimens have been deposited by Mr. Garretson in the museum of the Sioux City Academy of Science and Letters.

H. C. POWERS.

Sioux City, Iowa, October 14, 1910.



BURIAL GROUND AT BROADSTAIRS.—A burial ground found at Dumpton Park Drive, Broadstairs, England, consists of graves dug in the chalk subsoil at a depth of one foot. The bodies had, as a rule, been buried full length. Two, however, had been doubled up. Among the articles found were a lobed drinking-cup of green glass, an earthen urn and a small circular brooch set with 8 slabs of garnet. Among the glass beads were double and triple pearls; also amber and amethyst. The finds are similar to those at Sarre about 9 miles away.



SPHYNX PARTLY COVERED WITH SAND

A VISIT TO THE PYRAMIDS OF GIZEH Part II

AT THE end of the preceding paper we were describing the so-called "King's Chamber." We will next described the imperial way in which the wonderful architect constructed the roof of this chamber, which is the glory of the whole edifice. His task was no easy one; for he had to contend with the mountainous pressure of the solid mass of stone above it—it was over 300 ft. to the apex (the floor of the "King's Chamber" is 139½ ft. above the base of the pyramid)—and yet make a simple flat ceiling for a room over 17 ft. in width, and not cover the void by causing the side walls to gradually approach as in the "Grand Gallery"—the room is too wide for that—nor by leaning blocks together in the form of a gable as in the roof of the "Queen's Chamber." The Egyptian architects seemed to prefer immense flat ceilings in all their work. So

nine colossal lintels of granite, each averaging 26 ft. 8 in. in length by 4 ft. 4 in. in width and 6 ft. 1 in. in height, and containing a mass of 700 cu. ft. and each weighing about 54 tons, were made to span the space. But the weight of the superincumbent core masonry above was not to rest directly upon these giant girders; 5 low relieving spaces, separated by 5 ceilings similar to the first, the top-most one, however, having the form of a gable composed of two rows of huge stones set against one another at an acute angle, were built for the purpose of discharging laterally the enormous vertical pressure from off the ceiling. The architect seems to have had the danger of earthquakes in mind. If these ceilings were broken, the downward pressure on their ends would probably cause them to form a series of gables like the top-most chamber instead of allowing them to fall into the chamber below.

In order to deceive would-be spoilers and keep them from knowing the whereabouts of the King's sepulchral chamber, a small opening (shown in the photograph) was left at one of the upper corners of the "Grand Gallery" leading into the lowermost of this series of relieving chambers. Earlier visitors, including the Arab spoilers themselves, did not know of this opening. It was first discovered by the English traveler Davison in 1765, and was then found to be clogged with the refuse of the bats which had inhabited the gallery since the Arabs forced an entrance centuries before. In 1838 Col. Howard Vyse worked a passage upward through the surrounding limestone masonry to all the other spaces. Today it is very difficult to reach these chambers, and for the ordinary traveler impossible. Only a few Egyptologists have had the hardihood to endure the close quarters and stifling air.

In the top-most of one of these garrets never intended to be entered, hidden away for so many centuries, safe from defacement and so placed as to be beyond all suspicion of its genuineness, Col. Vyse found the cartouches or oval rings, sought elsewhere in the pyramid in vain, which contained the royal names in hieroglyphics of Khufu and Knumu-Khufu. They were painted in red ochre and seem to have been the quarry marks which the masons had painted on these giant granite girders before they left the quarry. These names have been identified with the Suphis I and II of Manetho's lists. Knumu-Khufu is supposed by many to have been the brother and co-regent of Khufu, and did not succeed the latter as is confirmed by the length of the two reigns as given by Manetho, either 50 and 56 years or 63 and 66 years respectively. This discovery of Khufu's name within the pyramid fully substantiated its traditional ascription to this far off Pharaoh. It was a most important discovery from another point of view also. For this is the first Egyptian monumental record that coincides with historical tradition—the actual name of this first Pharaoh of the IV Dynasty being found on a monument ascribed to him by Herodotus. Contemporary monumental inscriptions date even from the time of Sneferu, a king of the III Dynasty, but here we have only the monuments themselves to rely upon.⁶ Lepsius says that Khufu's tomb is the monument "to which the first link of our monumental history is fastened immovably, not only for

⁶ The cartouches of kings of the I and II Dynasties found on many monuments are now supposed to have been placed there by later hands.

Egyptian, but for universal history." The other two great pyramids of the Gizeh group have also been identified by contemporaneous inscriptions. Though that of Khafra—corresponding to Sepses of Manetho (whom he wrongly ascribes to the V Dynasty) and Chephren of Herodotus—itself contained no inscription, the cartouche of this Pharaoh was found on his portrait statue found in the ruins of the adjoining "Granite Temple" uncovered by Mariette and also on the fragment of a marble sphere found close by the pyramid and the temple. This pyramid is ascribed to him by both Herodotus and Diodorus. In the mortuary chamber of the "Third" pyramid, assigned by Herodotus to Mycerinus, there has been found on the lid of the rifled sarcophagus the cartouche of this Pharaoh "Menkare" (Menkaura)—the Mencheres of Manetho's lists. Even the withered relics of a body supposed to be that of Menkare—though some think they are the remains of a mediæval Arab—were found in a neighboring passage in this pyramid and are now in the British Museum.

It was Abdulatif, the Arabian writer already mentioned, to whom we are indebted for the oft-quoted words "All things fear time, but time fears the pyramids." But time has also done her ceaseless work here as well as on the exterior, where the top and the casing stones are gone and deep breaches made in the sides. The wonderful architect could plan to keep the weight of the upper masonry from crushing in the roof of the chamber under all normal conditions; but there was one thing against which he could not provide—earthquakes. Maspero and many other writers tell how for thousands of years the masonry of this roof has not yielded a hair's breath; but the close inspection of Petrie has a different tale to tell. He has found that the whole chamber has been shaken larger, that the end-walls have sunk perceptibly—as much as 3 in. above in the relieving chambers—and that the side walls have visibly parted and consequently every beam of these upper spaces has dragged or has been torn out bodily from the wall on the south side, and every one of them has been broken on that side—the result of earthquakes. Some writers have assigned these changes to the effects of but one earthquake, that of 27 B. C. The beams today are held in place only by sticking and thrusting, and it seems only a question of time—decades of millennia it may be—before Khufu's burial vault will finally be a mass of ruins. One of the uppermost girders is daubed with cement, as if this one at least had been broken even before the roof was finished.

Before leaving the interior one more passage should be mentioned. Just where the ascending passage forks, is seen the gaping mouth of a tunnel—about 21 by 48 in. in size which descends through the core masonry and rock until it finally opens into the descending passage just above where this enters the subterranean chamber. It was discovered in 1763 by Davison and its lower exit was found later by Caviglia, both ends having been plugged originally. This tunnel is still called erroneously the "Well." But in 1831 Wilkinson found the explanation of this curious shaft. It was built as an after thought, as a means of exit for the workmen, who, after the priests had laid Khufu's mummy away in his vault, slid the huge granite portcullis block—originally standing in the space between the ramps on the sides of the "Grand Gallery"—down into position at the lower end of the

ascending passage. After these blocks were finally in place there would be no outlet for the workmen. The architect seems to have forgotten this during the construction of the pyramid, and to have later bored this irregular hole through the masonry with no reference to the joints of the core. But just how the workmen could manage to get down this long and almost perpendicular shaft is a mystery. Its lower end was probably faced with a limestone plug like the stone concealing the entrance of the ascending passage, being of the same material as the roof of the long descending one. Treasure seekers and archaeologists have sought in vain for other chambers in the "Great Pyramid." Besides the excavations of the Arabs already mentioned, Colonel Vyse in 1838 made a deep cut in the southern face, but without success. Mechanical evidences seem to prove a general focusing of architectural excellence in the whole structure toward the granite chamber of Khufu, in such a manner as to exclude the presence of any other rooms.

As has been said, only the descending passage seems to have been known in Roman days. However, the upper chambers show some evidence of having been rifled long before the Arabs entered them in the VIII century. A large piece of quartz was discovered beneath Khufu's sarcophagus for the purpose of tilting it up, which Petrie thinks must have been brought there before earthquakes had littered the floor with granite chips fit for the purpose. He thinks that this opening was made through the well shaft whose existence may have long been known by tradition, and that it took place sometime during the civil wars of the rival rulers of the VII to the X Dynasties, *i.e.*, about 3300 to 3000 B. C., when the statues and temples of Khafra, the son and successor of Khufu, were destroyed. Then it is probable that the lid of Khufu's sarcophagus and his mummy were removed from the granite chamber and the coffer and the statue of the problematical Knumu-Khufu from the "Queen's Chamber". As an historical parallel to this hatred of former rulers he adduces the violence offered to the ashes of the old French kings at St. Denis in 1790. There is also some little evidence that another opening was made during the Persian domination of Egypt, 525-333 B. C. But it may be as Herodotus and other writers have mentioned, that Khufu's body was never hidden at all in his tomb but was secreted elsewhere. Most modern writers, however, think that knowledge of these upper passages was first gained by the Arabs in the IX century A. D. when the Caliph of Cairo, Al-Mamun (813-833) forced a way into the interior.

The romantic story of this forced entrance has been told by many Arab writers. Al-Mamun was the son of the famous Haroun al-Raschid (765-809) known to every reader of the "Arabian Nights." His imagination was aroused by stories, current among his courtiers, of great treasures secreted in the pyramid. At last he was induced to undertake the almost hopeless task of finding a way into this mountain of stone. It is probable that he only continued the unsuccessful attempts carried on by his predecessors. Dionysius, the Jacobite patriarch of Antioch, who accompanied him, says (in the account of Abdulatif) that an entrance had already been made. Knowledge of the revolving stone door high upon the north face, which Strabo described, had been long since lost. The fact that on careful inspection it could not be found, is additional proof of the wonderful finish of the outer

casing. So a huge hole, 10 ft. from the ground and near the center of this face, some 35 ft. below the real concealed entrance, was hewn in for a hundred feet or more toward the center of the pyramid. Probably either a lingering tradition guided the Arabs in believing that this face was the entrance one, or the observed fact that most of the other pyramids had their entrances on this side. In lieu of explosives, only vinegar and fire were employed to loosen the masonry. The unwelcome task is said to have been abandoned several times, when finally the workmen heard the sound of a falling stone somewhere near them in the interior. They then turned their tunnel in the direction of the noise, and after excavating for 20 ft. they finally broke into the descending passage. The shaking of the masonry, caused by the repeated blows of their tools, had probably dislodged one of the plug blocks at the entrance to the ascending passage, or perhaps its limestone facing. It was impossible to remove these granite plug blocks; so the workmen burrowed their way past them through the surrounding softer limestone, and soon found themselves in the ascending passage above. This is still today the only mode of access to the upper chambers, as the portcullis stones have never been disturbed—and it is the roughest and most awkward part of the visit to the interior. The rest was easy. Some accounts tell how they found in the "King's Chamber" a stone mummy case cut in the form of a man and containing a body laden with jewels, which many writers still think was the mummy of Khufu himself. Others say that nothing of value was found, and so to silence the reproach of having spent so much money in vain, the caliph resorted to a cunning fraud. It is related that the workmen found an emerald vessel—which is said to be in Bagdad yet—full of gold coin amounting exactly to the sum total of their wages. Al-Mamum pretended to be much surprised that the ancient Pharaohs were so inspired as to be able to know just what Arab labor would be worth so many centuries later! Along with the treasure was also an inscribed marble slab which warned him to desist from further search!

After Al-Mamum's day the Arabs for centuries visited the interior of the pyramid, those, at least, who were able to overcome their fears; for the Arabic manuscripts tell horrible tales of the marvels which were to be seen inside—columns and statues of gold set with jewels, images of green stone, magic stones of various colors, mummies in golden coffers and even flaming eyed roosters. Sir John Maunderville, England's greatest traveler of the Middle Ages, who spent 32 years in the East and visited Egypt in 1350, was afraid to enter the pyramid because of the snakes reported to be inside. There also grew up in the Middle Ages a curious myth similar to that of the Lorelei on the Rhine, of a beautiful naked woman of great stature and pearly teeth who lived on the western side of the "Third Pyramid," and allured travelers from the desert, whom, after she had embraced, she deprived of reason. The myth is the subject of a well known poem by Moore. It probably grew out of the ancient story—told by Herodotus (ii 134)—of the famous courtesan Rhodopis of Naukratis, who was confounded with Rhodope the daughter of Menkaura, the builder of this pyramid.

The accurate geometrical design of the "Great Pyramid" has led to all kinds of speculations on its having been erected in conformity with cer-

tain fixed mathematical and astronomical calculations. Endless attempts have been made to discover the proportions supposed to be embodied in it, and so to prove that it had a symbolical significance. Most of these theories date from the time of Napoleon's expedition to Egypt in 1799-1801. One of the savants accompanying him, Jumard, took very careful measurements of the pyramid and displayed much more ingenuity than sense in attributing the proportions of the structure to some mysterious significance. Though the conclusions at which he and others have arrived are fantastic enough, still a few facts seem to be incontestable, a few of which it will be interesting to briefly mention.

The earlier pyramids, as those at Gizeh, are more accurately orientated to the cardinal points than the later ones. Thus the "Great Pyramid" deviates only 4' west of true north. As its corner sockets are only 12" out of square—a most surprising degree of accuracy when we consider that the rock upon which it stands rises irregularly inside the masonry to a maximum height of at least 25 ft., thereby making diagonal measurements nearly impossible—we might have expected still greater perfection in the orientation. There is the same divergence in the "Second Pyramid." It is clear that the north point was later redetermined in the case of the "Great Pyramid," when the casing blocks were put on, but not so accurately as at first, for the core agrees more perfectly in orientation with the interior passages than the outside veneer—if we can judge from the few fragments of it left. This is a further indication that the careful supervision of the earlier architect was not kept up by his successor. This discrepancy from true north may be partly explained by the fact that the north point itself has changed somewhat in the last 60 centuries. Many investigators have attempted to date the building of Khufu's tomb by the position of some known star which would shine directly down the entrance passage at an easily computed date. Thus Alpha Draconis was in this position 2162 B. C. and the pole star in 2200 B. C., dates which are now known to be far too late.

That the original designer had certain geometrical formulæ in mind is clear. Thus the angle of declination in the slant faces was such that the original height of the structure was equal to the radius of a circle which would circumscribe the base; this is so accurate, and the same proportion is so equally true of Sneferu's pyramid at Medum—built by Khufu's father—that it is manifest that this proportion was intentional. It is furthermore confirmed by the presence of the numbers 7 and 22 in the number of cubits in height and base respectively, the ratio $22/7$ being an approximation to π . With these numbers the designer used 7 of a length of 20 double cubits for the height, 22 of this length for the half circuit of the base, making a rise of 14 on a base of 11. The floor of the "King's" chamber is exactly at the level where the area of the horizontal section is half that of the base, and its diagonal equal to the length of the base; the width of this section, therefore, is equal to half the diagonal of the base. It is also true that this section halves the vertical section of the pyramid. The floor of the "Queens Chamber" is placed at half this height above the base in the middle of the pyramid north and south. The same proportions are also visible in the construction

of the "King's Chamber;" here the perimeter of the chamber is a circle described by its width as a radius, and the length of the side is equal to the diameter of this circle. The granite sarcophagus is constructed exactly on the scale of one-fifth the size of this room, and its outside length is just one one-hundredth of the length of the base of the pyramid. On the ground of these few indubitable facts, all kinds of extravagant and ridiculous theories have been constructed.

After thus describing the exterior and interior of the Great Pyramid, we will next briefly discuss the various problems concerned with its construction.

The enormous amount of labor required to build it has always been the cause of much wonder. Herodotus, in his cursory account, says that 100,000 men, laboring together and being relieved every three months, consumed 20 years in the work. He adds that 10 more years were occupied in erecting a stone causeway for transporting the materials up from the base of the plateau. Remains of this roadway, paved with polished limestone, which was 5 stadia or $\frac{3}{4}$ of a mile long, 60 ft. wide and at the highest points 48 ft. above the inundating waters, are still traceable. It ends close to the eastern face of Khufu's pyramid. The Arabs partly restored it for use in removing the incrustation stones to Cario. Diodorus gives 360,000 as the number of the men employed for 20 years in building the "Great Pyramid." His computation is doubtless based on the 360 days in the old Egyptian calendar. Both the figures of Herodotus and Diodorus have been looked upon as purely mythical. But latterly Petrie has tried to explain those of Herodotus, as his is the more circumstantial account, by a consideration of the internal economy of Egypt today. The inundation of the Nile lasts for three months during which time all labor is at a standstill, and he thinks that this time was employed in the construction of the pyramid, thus explaining how so great a number of laborers could have been drawn from so small a country at one time. Skilled masons would be employed the whole year around, both at the quarries and at the pyramid itself, quarrying and dressing the blocks. He assumes that the workmen mentioned by Herodotus were merely the unskilled laborers who transported the stones. He argues that if gangs of 8 men worked together in transporting an average block of $2\frac{1}{2}$ tons *i.e.*, 40 cu.ft., and managed on the average 10 such blocks during the 3 months—bringing them from the quarry to the Nile, and down across the river in boats and up the causeway—100,000 men would handle about 125,000 such blocks in the given time, which would require about 20 years for the 2,300,000 average blocks composing the structure.

That much final work was done at the pyramids is proven by the remains of workmen's barracks, large enough to accommodate about 4000 men, which are are still to be seen near the "Second Pyramid" where the stones were trimmed into shape. And though Diodorus says there is no trace of the hewing of stone around the pyramids, still vast quantities of chips—estimated at one-half the bulk of the pyramid—were thrown over the cliff to the north and south of the "Great Pyramid," thus forming an artificial enlargement of the plateau, extending for some hundreds of yards outwards from the rock's edge. These masses of chips are very interesting;

for they show peculiar stratification, according to the kinds of refuse thrown out at different times, strata composed of large chips alternating with those of smaller ones. Among them have been found fragments of clay water-jars and bits of wood and charcoal and even pieces of the very strings with which the workmen mended their baskets.

Though the execution of important details must have been in the hands of skilled workmen, the vast majority of the laborers was doubtless made up of men called from all sorts of occupations, such as the plow, the oar, the tending of cattle, etc. This explains the singular inequalities found in most Egyptian structures, in such marked contrast with the care everywhere displayed in Greek work. Those glorious buildings on the Athenian Acropolis—in bulk but sorry counterparts of these huge piles at Gizeh—show in all their details an equally careful design, executed almost as exactly and perfectly in the concealed parts as in the visible ones. One feels that the work throughout was entrusted to trained artisans, to men who were possessed of a love of beauty and felt a real pride in their efforts, which was wholly impossible under Egyptian conditions. Though we know the names of many Greek builders, we do not have the name of a single architect of these masterly constructed tombs. Hieroglyphic inscriptions will name with weary details the princes and nobles and scribes who had to do with the works of the Pharaohs, but never a word about the architects, or their able assistants, draughtsmen, sculptors or painters. These all lived humble lives, being classed along with carpenters, shoemakers and other artisans. Yet many of them produced incomparable works of art, like Khufu's tomb or the portrait statue of Khafra to be mentioned later. We now know exactly how one of the actual "bosses," who were in charge of the workmen engaged in building the pyramids, looked. A wooden portrait statue of Raemka, "superintendent of works" of that early period, was discovered during the excavations at Sakkara and is now in the museum at Gizeh. It so closely resembled the modern village chief that the workmen called it after him the "Sheik-el-Beled"—Sheik of the Village, a name by which it has been known among scholars ever since. The heavy muscular body expresses only vulgar self-contentment; the big head set firmly upon the thick neck, has, however, a look of great energy. The boss is represented in the midst of his laborers and has his staff in his hand ready for instant use. The life-like expression of this statue marks it as one of the masterpieces of Egyptian sculpture.

Many of the old writers record how the Egyptians were impressed into the service of Khufu and Khafra, who have been painted as the worst of tyrants and thoroughly hated by their subjects. Herodotus lays many crimes at Khufu's door; he closed the temples, forbade sacrifices and compelled the people to work on his tomb, and both he and his son Khafra were addicted to every personal vice. Diodorus also says the people execrated them both to such a degree that they charged their relatives to conceal their bodies elsewhere and not lay them away in the sumptuous tombs they had prepared. Herodotus says that even in his day the Egyptians were unwilling to mention their names, and so called their sepulchres after a shepherd, Philition, who used to keep cattle in those parts. Pliny says that they

erected them "to deprive their successors and rivals, who were plotting against them, of money, or perhaps for the purpose of keeping the people engaged." And Diodorus says that their architects deserve more admiration than the kings who built them. Their tombs have ever since been looked upon as monuments of despotic power and pride. Though there doubtless is some truth in the old tradition, still the fact that Khafra reigned so long after his father's death, and was able to construct a pyramid almost as large, makes it impossible to credit such stories literally. Common sense alone would suggest a higher artistic motive for such perfectly constructed monuments. And it is impossible to believe that a hated tyrant, even in ancient Egypt, could have impressed 100,000 unwilling workmen for so many years. On the contrary, undertakings of such magnitude bespeak a long era of peace and security. Such giant structures, just as the mediaeval cathedrals, could have been erected only when the whole people were completely dominated by one great idea, one great purpose. In the Middle Ages the controlling and impelling idea was furnished by religion—concentrated, bigoted and universally accepted; in ancient Egypt, it was the idea of monarchy—abject fealty and obedience to the will of an almost irresponsible master. And today—in the absence of both ideas—it would be as impossible to duplicate one of these huge piles of masonry as one of the great mediaeval churches.

In ancient Egypt there was no such regard for individual life as is felt in modern civilized countries. Even at the present day life in Egypt as all over the Orient, possesses but little value. Only recently the fellaheen were employed on the Suez canal under a system of practically forced labor, their strength being as mercilessly exhausted as though they were mere cattle. Said Pasha built the Sweetwater Canal at Suez in 5 years with the help of 25,000 peasants; 250,000 were used in building the Malmudijeh part of the canal for the space of one year; the hardships which they endured must have been terrible, since 20,000 are said to have died. We can safely assume that the ancient Egyptians were no more scrupulous than their descendants; but the impression that Khufu and Khafra were exceptionally merciless and brutal in their treatment of their laborers, seems ill founded. The size of their tombs alone would be sufficient to start such stories. We know from contemporary wall paintings that the discipline enforced by the Pharaohs was very severe, and we know that in the iron-clad caste system of old Egypt, the lot of the laborer was hard; but still there is little ground for believing in the wholesale oppression so generally imagined. On the contrary, instead of the labor entailed in such vast undertakings being ruinous to the people, the training acquired must have been beneficial to the national character, and employment, during the inundation, must have been a boon to impoverished thousands. It was Plato who said that tombs ought never to encroach upon ground from which the living could subsist. So it is no sign of the wanton disregard for the rights of their subjects that the Pharaohs, in a land where every acre of tillable land is so important, built these vast cemeteries on the edge of the desert.

Egypt had reached so marvellous a proficiency and dexterity in the arts 6000 years ago, that they still excite our astonishment. They could



DR. HYDE'S PARTY AT THE FALLEN COLOSSUS OF RAMESES II AT MEMPHIS

quarry huge blocks of the hardest stone, and transport them for many miles and raise them to great heights; they could polish granite and carve on this hard material, with the greatest ease, hieroglyphics of the minutest kind, long before steel was known; and they could sculpture most beautiful statues out of granite and harder diorite and basalt with amazing skill; even now with our modern tools it is difficult and costly to carve plain letters on any of these substances. Though many of the processes then in use are still unexplained, enough is known to dispel a great deal of the popular mystery attached to them.

In the first place let us consider briefly how such enormous stones were quarried. The sandstone quarry at Silsilis still shows many scars left by the workmen's tools which tell us their mode of detaching stones. The size of the block was first outlined in red ink, to indicate the form it was to take, *e.g.*, the head of a capital, or a statue; then the vertical faces were divided by means of iron chisels driven in perpendicularly. To detach the horizontal under face, wooden or bronze wedges were driven in the direction of the natural strata of the rock. At Syene, in upper Egypt, I saw a granite obelisk over 100 ft. long, whose underside is still undetached from the rock; at Tehneh there are many drums of columns only partially disengaged, the boring holes into which moistened wooden pegs were set, being still visible.

The blocks were transported in various ways. Many quarries, as the one at Syene, were literally washed by the Nile, so that the stones had merely to be lowered into barges or specially made boats, such as one which is depicted on a relief from Deir-el-Bahri. Elsewhere canals were dug to con-

nect the quarry with the river, as at Turah, whence most of the limestone of the pyramids at Gizeh came. The barges were thus brought to the foot of the cliffs. Wherever water transport was excluded, the stones were drawn on huge sledges either by men or oxen. If the road was difficult, oxen were used, as is seen in a relief from Turah dating from the XVIII Dynasty. The drivers in this case are Phœnician slaves, as we learn from the accompanying inscription. Men were used more often than oxen as the propelling power. A relief from the time of the Middle Empire shows how men were harnessed to sledges. This relief was found in the tomb of Thothothu at Bershah, and depicts a sledge containing an alabaster colossus of that prince—perhaps 20 ft. high—being dragged to his tomb. The statue is securely bound to the sledge by means of ropes, sticks being used to prevent slipping and small bits of leather being placed underneath as a protection against chafing. One hundred and seventy-two men are harnessed to four long ropes, so arranged that two men can grasp the rope at the same place. At the forward end of the relief are men carrying the ropes on their shoulders. An overseer stands on the knee of the statue and is shouting and clapping his hands in issuing his orders; another stands upon the base and appears to be sprinkling water on the road, while a third is offering incense. Alongside the sledge are men with water and a huge plank, who are driven along by overseers armed with long sticks. The relatives of the prince bring up the rear and the townspeople have come out to meet the procession which is presumably a rare occurrence in their village. Doubtless the stones of the pyramids at Gizeh were dragged in this fashion over the causeway leading from the Nile village to the Gizeh plateau.

Let us next consider how such enormous blocks were hoisted aloft into position. Unfortunately, we have no bas-reliefs or wall-paintings to explain the methods, and yet this seemed to bother Egyptian engineers very little. The few simple cranes to be seen on the tops of walls, in temple bas-reliefs, are manifestly inadequate for such undertakings. Judging from the difficulties experienced by mediæval and modern builders, it is hard to understand how the Egyptians with the few appliances at their disposal managed such masses. The greatest wonder however, is not afforded by the pyramids, but by obelisks and colossal statues. The largest obelisk in existence—that of Queen Hatshepsut at Karnak—is a monolithic granite block 109 ft. high, 8½ ft. in diameter at the base and contains 4873 cu. ft. of stone, weighing about 367 tons. We learn from the inscription upon it, that it was quarried, shaped, transported, engraved and erected all in the short space of 7 months.⁷ What contracting firm of the present day would undertake to duplicate such a feat! And yet inscriptions mention still larger obelisks. Rawlinson says in this connection; "It is doubtful whether the steam-sawing of the present day could be trusted to produce in 10 years, from the quarries of Aberdeen, a single obelisk, such as those which the Pharaohs set up by dozens!" Statues arouse even greater wonder. The giant statue of Rameses II in the Ramasseum at Thebes, sat 60 ft. in height and weighed no less than 1000 tons; another of this same Pharaoh of the XIX

⁷ *Hist. Ancient Egypt*, Vol. I p. 498.

Dynasty, found in fragments at Tanis, stood—according to the measurements of Petrie, its discoverer—90 ft. high without its pedestal, or 120 ft. with it. The two Memnons seated at the entrance of the temple of Amenhotep III at Thebes, measured 47 ft. in height, and each was hewn out of a single block of granite. It has been conjectured that the architects and contractors of the Pharaohs possessed very highly developed mechanical contrivances to make possible the erection of such huge stones. However, nothing has been discovered to corroborate such a view and no Egyptologist of today doubts that these marvels of transporting and raising into place such masses of stone were effected by one power alone, viz., the enormous expenditure of human labor. For the greatest tasks can be accomplished by the simplest means, if enough workmen and time can be used. They probably had no other help in lifting such masses than the simple devices of inclined planes of earth together with the use of ropes and sacks of sand. So the hoisting into place of the stones which composed such structures as the Temple of Karnak, now the most majestic ruin in the world, and these tombs of Khufu and Khafra should not excite our wonder, if the same workmen could raise such gigantic obelisks and statues as those mentioned.

The naïve astonishment so often expressed over the erection of these monuments should yield to the explanation which is to be found in the methods used at the present time in restoring the fallen columns at Karnak. For this is doubtless the same method which was employed when these columns were first erected. Inclined planes of earth are nowadays constructed, up which the stones are dragged. Just before the completion of an Egyptian temple, its interior must have been full of earth or sand even to the roof and the last task was to remove this solid "scaffolding." Similarly there must have been just such a solid embankment leading to each pyramid, over whose surface the stones were hauled, the pyramid and dike rising simultaneously. Even down to Graeco-Roman times, there were traditions of just such embankments. Diodorus, though sceptical about it, records that the Egyptians in his time said that they were composed of salt and saltpetre, which later melted away before an inundation of the Nile. Pliny, however, gives the tradition credence. Up these great inclined planes, then, the stones were dragged with painful slowness, doubtless by some such system of "rocking" as the one proposed by Petrie. The stones would be placed on two piles of wooden slabs, and then with the aid of crowbars, slowly "rocked" upwards, first one side and then the other being raised, the underlying piles alternately heightened and the stones advanced horizontally on rollers pulled along by men with the aid of ropes. If, for example, the largest stones, the roof girders of the "King's Chamber," each averaging 26 ft. in length and weighing 54 tons, were placed on two such supports only 2½ ft. apart, only about 5 tons would have to be lifted at one time at the end, an easy enough feat for 10 workmen armed with bronze bars. Plates of sheet iron would be used to ease the rollers and keep the crows from biting into the stone. The fragment of just such a plate was actually found in the mouth of one of the air-shafts leading from the "King's Chamber." Iron seems to have been known in Egypt, though not used to any extent, before the VIII century, bronze—an alloy of copper and tin known from

very early times—taking its place. Only a few bits of free iron, like the piece mentioned, could have been used at the time of Khufu, as his workmen would have had but little idea as to how to work it.

So the wonder is not how such stones could be raised into position, but rather how they could have been so carefully joined without injury to their edges.

Let us consider next for a moment the tools which the Egyptian masons of that remote time had at their disposal. We learn from bas-reliefs that sculptors in their ateliers used the toothed chisel, the drill and the gouge, and polished the surfaces of their sculptures with fragments of quartz. Even the points which dotted the work are often indicated. Hard stones, such as granite and diorite, must have been worked with bronze tools set with cutting points harder than the stone. Only 5 substances are known to be harder—beryl, chrysoberyl, topaz, sapphire (corundum) and diamond. Diamonds were, however, too rare and expensive, and besides are not found in Egypt; so, as sapphires are much commoner, it may be supposed that they were employed. Primitive people often cut hard materials by means of soft substances, such as horn or copper, by applying a gritty powder and thus scraping and wearing the surface away. Some are inclined to think that the Egyptians knew this method only, which was certainly used in working alabaster and other soft stones. But that cutting jewels were actually known seems to be sufficiently proven by fragments of bowls of diorite of Khufu's time, which have been found at Gizeh; here the hieroglyphics are not scraped in, but incised, as is evidenced by their edges being sometimes only $\frac{1}{200}$ of an inch apart.

Just as these bowl gravers used jewel-pointed tools, so the saws which the masons used, must have been set with jewels, since grooves of uniform depth are visible in many granite blocks. That saw-blades were of bronze, is shown by the presence of green stains, found on the sides of the saw cuts in sarcophagi and grains of sand still left in them. These saws were both straight and circular, varying from .03 to .2 in. in width according to the character of the work. Some of the straight ones must have been 8 ft. long, since the sides of Khufu's sarcophagus, which shows several cuttings where the workmen sawed at wrong angles, thus causing them to draw the saw out and start afresh, are $7\frac{1}{2}$ ft. long. Parallel arc grooves prove the use of circular saws or tubular drills. They varied from $\frac{1}{4}$ of an in. to 5 in. in diameter; for many bits of stone of these sizes, the remnants of the core sawn around, have been found. Such tubular drilling was employed on a large scale in hollowing out granite sarcophagi; a series of holes was drilled close together, the cores and intermediate pieces of stone were then broken out, and the process repeated until the requisite depth had been attained and then the surfaces were polished with quartz. The remains of two such holes, too deeply cut, are still visible on Khufu's sarcophagus. With such tubular drills, the Egyptians did what engineers say cannot be surpassed today with the modern diamond drill. Often the drill would be stationary, and the block of stone would rotate, thus proving that the Egyptians understood the use of the lathe, which was employed extensively in hollowing out bowls of diorite. Enormous pressure was needed to force the drills and saws down-

wards; it has been computed that a pressure of one to two tons was needed to drive a 4 in. drill through granite. Few of these tools have survived to our time; with the exception of a dozen common masons' iron chisels, practically none. But their use is well attested by such work as has been described. Nor is it strange that so few of these tools have been found. Most of the iron ones, if lost by the workmen, would have been consumed by the slow process of oxidation; and the expensive jewelled ones doubtless belonged to the state and so were not likely to get lost. The bronze tools could have been remelted and used again and again, which would explain why none of them has been recovered.

It was in 1881 that the world was electrified by the discovery, in a secret rock-hewn chamber on the site of ancient Thebes in Upper Egypt, of the mummies of nearly all the Pharaohs of the XVIII to the XXI Dynasties. Among them were those of Rameses II (about 1347-1280 B. C.), according to some the very Pharaoh of the Israelite oppression, and of his father Seti I (about 1356-1347 B. C.), the builder of the great Hall of Columns at Karnak, perhaps the most impressive edifice ever erected. Their bodies were so well preserved that—to use Maspero's words—"Were their subjects to return to the earth today, they could not fail to recognize their old sovereigns." Though we can never expect to recover the actual bodies of the kings of the far away IV Dynasty—that of the pyramid builders at Gizeh—still we know how they looked in life. Though the statue of Khafra had long been one of the main treasures of early Egyptian portraiture, no portrait had come to light of his more celebrated father. But a recent fortunate discovery enables us now to view the actual face of Khufu and realize the energetic character of this the most ruling character of all Egyptian history. For in 1903 there was found in the excavations at the temple of Abydos an excellently preserved and exquisitely worked ivory statuette of this far off Pharaoh. The work is of extraordinary delicacy and finish, and shows that ivory carving was at its height at this early period. That it is really the portrait of Khufu is put beyond doubt by the fact that his name is carved on the front of the throne upon which he is seated. Its discoverer, Prof. Petrie, says of it (*Abydos*, Part II, p. 30); "The idea which it conveys to us of the personality of Khufu, agrees with his historical position. We see the energy, the commanding air, the indomitable will and the firm ability of the man who stamped forever the character of the Egyptian Monarchy, and outdid all time in the scale of his works. No other Egyptian King that we know resembles this head; and it stands apart in portraiture, though perhaps it may be compared with the energetic face of Justinian, the great builder and organizer." And in another place (*The Ten Temples of Abydos*, in *Harper's Magazine* for 1903) he says; "The first thing that strikes us is the enormous driving power of the man, the ruling nature which it seems impossible to resist, the determination which is above all constraint and all opposition. As far as the force of will goes, the strongest characters in history would look pliable in this presence. There is no face quite parallel to this in all the portraits we know—Egyptian, Greek, Roman or modern." Some years before, the French Egyptologist Mariette had found in a heap of rubbish at the bottom of a well amid the ruins of the "Granite Temple" at Gizeh,

together with 9 others, a life-size statue of Khufu's son and successor Khafra, the builder of the "Second Pyramid." This statue, not only remarkable, like the statuette of Khufu, for its great age—it is nearly 6000 years old—but for its majestic pose and wonderful finish of detail, is a masterpiece of the sculptor's art, carved out of a piece of polished green diorite. The Pharaoh is represented as seated upon a throne, his hands in his lap, his body seated firmly upright, and his haughty head thrown back with a look of pride. A sparrow-hawk, perched upon the back of the throne covers his head with its wings, the image of the god Horus protecting his son. The life-like expression, the wonderful modeling, the dignified pose and the technical ability displayed in carving all this out of so hard a substance as diorite—all unite in making this marvel of sculpture comparable to the best works of classical antiquity. If the cartouche on the throne containing his name were wanting, still we would know that this was the portrait of a Pharaoh from its royal bearing, which indicates a man accustomed to unlimited power. This was one of the numerous cult statues of Khufu and Khafra, which were preserved both at Gizeh and at Memphis in the Temple of Phtha, where visitors could see the features of the mighty pyramid builders as if they were alive. For the worship of both these Pharaohs continued for thousands of years, at least down to Roman days, as Strabo recounts.

The discovery of such masterpieces as these portraits throws great light on the antiquity of Egyptian art. It shows that the art which could produce such carvings in ivory and stone 60 centuries ago, like the art which produced the Sphinx and designed the pyramids, had already in that far off time arrived at a maturity which argues many centuries of growth and experience. How many ages must have preceded such maturity can only be conceived when we remember how slow the steps from barbarism to civilization have been in other countries. At the very dawn of her history, Egypt displays a wonderful degree of civilization. Tablets from the time of Sneferu, the father of Khufu, show that it was almost as well organized then, as it was at the time of Alexander's conquest nearly 40 centuries later. Nearly all branches of literature—the drama excepted—were already well developed. Systems of astronomy, theology, philosophy and society were already old; the hieroglyphic and hieratic writing already perfected. Architecture, sculpture and painting must have existed for many centuries, for in the works of the kings of the IV Dynasty, the glory of these arts was at their height. The skill in engineering and mechanics displayed in the tombs of these Pharaohs has never since been surpassed.

But even thus early, this civilization had ceased to be progressive and had become stationary. The past—as in China—soon began to serve as a model, and stagnation set in. This is particularly seen in the case of art. Originality and freedom at first characterized Egyptian sculpture and painting. The life-like statue of Khafra shows this, and even more the wonderful expression of the ivory statuette of Khufu, or of another, many hundreds of years earlier, of a king of the I Dynasty, also found by Petrie at Abydos in 1903, shows it. These ivory carvings in their absence of convention stand above all later Egyptian works of art. For very soon, sculptures, as well as painting, became shackled by conventional rules and so became immobile

Soon all Egyptian art came to be dominated by religious rules. But the artist, whether in chiseling or painting representations of the gods, came in time to be the slave of these conventions and was not allowed to change the methods handed down from his ancestors. Plato said that the pictures and statues in the temples of Egypt in his day were no better than those that had been made "ten thousand years" before. It was Wilkinson who said that Menes would have recognized a statue of Osiris in the temples of the last of the Pharaohs. For not a line in the sacred form was changed for thousands of years. Architecture—the Egyptian art *par excellence*—whether we see in it tombs or temples, reached its high degree of perfection in the Memphite period—in the time of the Pyramids. Even the art of building tombs in pyramidal form ended with the XII Dynasty—for those of Nubia are merely later and inferior copies of these earlier more perfect examples. Almost the very first pyramids erected were the most marvelous ones.

For so many centuries Egyptian civilization and art were so immobile, that it is only by the aid of the cartouches of the Pharaohs, that dynasties and periods of their civilization can be distinguished. The stages of development and decay so easily observable in any European nation each century are here scarcely discernible in 10 centuries. It would seem as if the eternal blue of Egypt's sky, the regularity of ebb and flow in the life of her one great river, were in some mysterious way in accord with this fixedness of her civilization. But we are only yet in our infancy in the study of this hoary culture. What has already been brought to light and studied, is comparatively very little, for the Nile valley has only just begun to give up its treasures. Maspero, indeed, has said that the soil of Egypt contains enough to occupy 20 centuries of workers. So what seems to us now in our imperfect knowledge to be fixedness and stagnation, may be due, in large measure, to our lack of knowledge, and some day Egyptian art may show degrees—however infinitely slow—of progress and decay.

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FRONT AND SIDE VIEW OF IVORY STATUETTE OF KHUFU FOUND AT ABYDOS
BY PETRIE IN 1903

From Petrie's *Abydos*, Part II.



STONE SQUARE—PROBABLY AN ALTAR IN THE MAZATEC COUNTRY

ARCHAEOLOGICAL REMAINS IN THE MAZATEC COUNTRY¹

THE Huautla road follows the Teotitlan river, crosses a number of dry water courses or *barancas*, continues on a nearly level stretch for some distance, then zigzags up the San Bernardino Sierra, 2,000 ft. above sea level. Mesquite trees, some small shrubs and different varieties of cacti are plentiful; the lighter varieties of the henequen or smaller *ixtle* are scattered here and there. Large patches of the hillside are stained, and there are other good mineral indications; some profitable mines may yet be found, though at present the spasmodic efforts at mining have not been successful in this vicinity. The vegetation increases as one ascends the Cumbre, becoming a forest of scrub oaks, some tall pines occurring in the more sheltered places, with the wind-swept exposed parts of the mountain bare. Nine thousand feet above sea level, near the summit, which is known from the supposed imprint of a large human foot in a volcanic slab, as La Cumbre de los Frailes, "The Summit of the Friars," are the first artificial works, consisting of some shallow ditches

¹To be followed by *Archæological trips through the Mixteca-Popoloca Country, and Milla as it is to-day.*

running in a straight line with the earth thrown on one side, giving the appearance of trenches, which they probably are, as some fighting occurred on this road.

On the San Bernardino slope the ground is loose, of a clayey nature but well mixed with small stones and rock dust. From San Bernardino to the Cumbre the soil is darker though the subsoil must be clay as is evident from the several deep cuts that have been dug to make the road. On the summit of the Cumbre the road bank on the left shows the different layers of soil; under the first, which is leaf mold and volcanic loam, may be seen a thin stratum of ash probably of the same date as the volcanic ash in the Petlanco basin, plainly seen near the blow holes of the Hot Springs. After passing the Cumbre the road rapidly descends with much the same vegetation prevailing for some distance until the clearings occur. Not far from the spring, on the comparatively level stretches there are what appear to be small artificial mounds. Like the small cairns and crosses that are occasionally found on this road as well as on others throughout the Republic, they are probably graves made in late years.

The first interesting archæological object is a large slab of rock evidently quarried at a considerable distance. It is well hewn and of about the same dimensions as the stone slabs found near Teotitlan and in the mounds on the banks of the Rio Salado near Tecomavaca. On the side of the road is a hole disclosing a larger opening that has been partly filled since it was uncovered. Plainly visible are the ends and sides of other slabs showing that the mound is probably the same size and of the same construction as those referred to, but part of the road running over the top has reduced its height. The excavation is recent. There is another similar mound also excavated before the descent of the Espinazo del Diablo begins.

An important mound is located on the Carlota Plantation. It is not large, having a circumference of about 40 ft. Successive cleanings and the different excavations have reduced its height. When first uncovered the rooms must have been below the surface; the slabs of stone used in its construction are much smaller than the Teotitecan blocks. Nearly 20 years ago, when it was first opened, it must have proven a rich find, for, according to the reports, there were many metal figures. Don Antonio Martinez, chief engineer of the Carlota Plantation, told me that the small silver animals were of fine workmanship. There were also other figures, and plates of slate with hieroglyphs, and a flat stone weighing about $\frac{1}{4}$ pound which was said to have been used as an ironing iron. Subsequent excavations have brought to light other objects of inferior value. The fact that the valley is good agricultural land and comparatively free from rocks in this locality may have led to its having been selected as a place for settlement, and the burial of a Cacique. An unusually large building site occurs in the vicinity and other smaller stone floors are to be found in several places.

The Mazatec country is a limestone region, especially Tenango, Chilchotla, Ayautla, part of San Juan Coatsospaum (which latter pueblo is Mixtec) and other localities. The earth mounds are nearly all covered with grass, and are isolated. The rainfall here is about 50 times greater than that of the Teotitlan valley and sandstorms are unknown so that the deductions made from the Teotitecan mounds are not applicable here.

Situated in those sections, the last to feel foreign influence, the stone squares or walls are distinctly dissimilar to any ruins of the surrounding tribes, and characteristically Mazatec archæological remains.

The stone square (or altar, which it may have been) situated at the lower end of Netzalmalcoyott is very similar to the one shown in the accompanying illustration, and represents the usual type. What their age is, it is impossible to say, but there are indisputable evidences of great antiquity.

The stone square is about 5 ft. long, $4\frac{1}{2}$ ft. high, 4 ft. wide. The limestone used in its construction consists of pieces broken from large stones and natural slabs. Although few of the blocks are square, nearly all show the work of the stone cutter. Cement is absent but the larger interstices are filled in with chips of the same stone. The first indication of its age is a large tree growing on the top; the second, the leaf mold at the base. But the strongest proof of great age is that newly broken limestone has a very white and glassy surface which retains its brightness for years though exposed to the weather; and the 4 sides of this block have lost not only their brightness, but their whiteness, and the rock has disintegrated to such an extent that fine dust may be scraped from the exposed sides of the stones with the finger nail. Although it is not a hard stone and the disintegration is not as great as on the top of some natural stones in the vicinity where the powder is very thick, it must have taken centuries to bring about these conditions, especially in view of the fact that while the rainfall is very heavy it is almost all perpendicular owing to the thick forest and underbrush; little rain patters on the sides of the square block, most of it sinking through the cracks at the top.

There is another square located near the former, somewhat larger and with a decayed tree trunk on the top.

A trip was made to the hot lands following a trail where one of the guides lost his life by stepping on a loose slab of limestone rock which dislodged a larger boulder that crushed him. Near the Narangal there are some indications of former habitation. In a clearing in the vicinity of Avendano's ranch is located the largest stone wall seen. The measurements are: 5 ft. high; 75 ft. long; 4 ft. wide. These figures are not exact. The wall is not straight but forms a slight angle at about its center. Another wall of similar dimensions lies close to the former.

Natural caves are to be found in many parts; the largest near the (Mazatec) pueblo of San Antonio extends over a mile underground. This cave was explored for some distance with the aid of ladders and ropes. Stalactites are suspended from the roof and stalagmites rise from the floor. A small stream fed by percolations from the roof runs through the cave. Close examination of the place where the water enters revealed a small dam, made of stones plastered with clay, which formed a little pool. Small pieces of charcoal were picked up on the flat surface of large boulders. Some of the large rocks were covered with black patches showing the location of former fires. A figure found here is $1\frac{3}{4}$ in. high, $\frac{3}{4}$ in. wide, and resembles a large thimble, being hollow and the sides shaved off by a sharp celt after it had been made and partly dried. The cuts are clean. A rude face and long hair is scratched on the top. This figure is probably an idol and



CUMBRE DE LOS FRAILES COVERED WITH SNOW

is a rare relic. A small celt with its sides chipped off was picked up in a hole in a rock with some natural pebbles. The dripping of water from the roof of the cave had caused the stones to work over one another and thus acquire a natural polish, yet several large flakes had been knocked off the implement, which was probably an unfinished celt of the smaller type. This was the only chipped stone picked up. On some rocks we noticed the well defined imprint of some animal such as a monkey—another rock had as many as 4 or 5 larger foot marks.

Another cave was visited twice; on the first trip it was entered by the light of large pine torches. Some cairns were uncovered, disclosing large skeletons lying at full length. Beside them a number of beads were picked up, and a large vessel of thick black pottery in the shape of a headless duck, its mouth being the neck. This jar had a coating of white cement as did the amphora-shaped earthen vessels of Teotitlan. Another grave produced a plate 14 in. in circumference of the most primitive make, showing the imprint of fingers and signs that it had been used over a fire. A few of the bones were petrified and loose ashes were mixed with the grave earth which was 4 in. deep.

On the second trip to this cave, I was accompanied by my friend Georg Von Rettegg. As the cave roof had fallen in giving the appearance of a hole, the descent was easy, but it was dark enough to compel us to use lights. My companion remarked that the atmosphere was heavy, and so it was, but being anxious to unearth some relics we continued digging. While in a stooping position the gas that filled the place overcame me; however, I revived and for once was discourteous enough to precede my friend, who tottered at my heels, gasping for air and very pale. Although this trip was not very productive we secured a shin bone and confirmed the reputation of the place as a haunted hole.

Such experiences occurred to several exploring parties in this region and in other parts of the state and should be a warning to others.

Mr. Edlo McCue, former Manager of the Carlota Plantation, told me that he visited some of the caves in the vicinity that were full of human bones and a few felices such as beads, etc. The skulls in these cliff caves are separated from the larger bones, and collections of bones thus separated were found in several of the caves. I examined a number of beads from this cave and found them to be about the size of those from other parts of the state. An idol similar to those of Teotitlan and the Mixteca had the legs drawn up in the usual sitting position. It was made of conglomerate which showed disintegration so that its original high polish could be seen only in specks. A large broken shin bone from the same source had a most perfectly executed design, the cuts were not deep but clean. Each design was about $\frac{3}{4}$ in. square interlocked in a string about 3 in. long.¹ Near the same source came a small clay cup. It had been placed in the cleft of a limestone rock, and, as Mr. McCue says, the rock had grown partly over it thus causing the partial closing of the cleft. The cup was thus locked up by the action of water over the cleft. If it is contemporaneous with the grave relics some idea can be had of their great age. Although not common, I have seen a petrified human bone thus imprisoned by the growing of the rock. This gentleman also spoke of numerous mounds to be found on the top of the cliff that overlooks Carlota. As the area is of the same extent and the situation impregnable—the location would seem ideal for such a people.

A custom among these people which still survives is the mixing of ground green tobacco with lime and placing it in the mouth to prevent snake bites and to ward off other possible harm. Large boulders by the wayside have artificial hollows on their even surfaces made by these medicine makers, the rubber used is a limestone, preferably an ordinary river pebble that is immediately discarded. Sunken places occur on flat rocks in the heart of the forest which may indicate that this was a very ancient custom.

Near the house foundations a number of what may have been metlapilles or rubbers with slightly tapering ends were picked up. The stone used was from foreign parts. Since the length was 9 in. and the ends were also

¹ See the similar but more simple design of P. xxxii, lower right hand corner, *Ruins of Milla*, *Bulletin* 28, Bu. Am. Eth. Smithsonian Institution.



CUMBRE DE LOS FRAILES SHOWING THE ROUND KNOB RISING 9000 FEET ABOVE
SEA LEVEL

highly polished by wear, it seems that their use was varied either as a pestle, or rubber, like a rolling pin, that crushes but does not roll, as necessity demands. Much larger stones of a spheroidal shape had two sides perceptibly worn; they were of granite and different kinds of close grained rock with a high polish. Their weight was about 10 pounds. Other stones of not so perfect a shape or polish were evidently used to deal blows with as well as to knead. Flat, irregular and in one case almost triangular stones averaging $2\frac{1}{2}$ in. in thickness, sometimes with only one side flat and varying in length and breadth from 8 in. to a foot, were lying uncovered on the house sites. The well worn and in one case slightly depressed center of these slabs is evidence that their use would correspond to that of the modern metate. A modern pestle for mashing peppers was picked up in the field where it must have been dropped by some passing native, likewise a number of broken bowls that cannot be associated with the ruins. Arrow points are scarce, only one broken head being found in the Tenango Section. The Indians claim that their former weapons were slings. We discovered numerous small round river pebbles, not of this locality, which could not be classed as anything but sling stones. These weapons still survive though they are rarely seen.

A single sea shell was found without any artificial marks; its presence with dishes, pestles, and celts in a large house site would seem to indicate that it was of value, especially in view of the fact that it must have been brought a great distance, the nearest place at which it could have been secured being many miles away near the sea coast. Beside the graves in

the caves mentioned, several bodies were placed in small clefts of the rocks, and under over-hanging rocks that could not have admitted the body entire. In these places the bones were all scattered over a small area, whether because of re-interment or separation of the different portions of the body as reported by Mr. McCue in the caves above Carlota, it is impossible to determine as no folklore refers to it. Some few beads were mixed with the dirt, but it is evident that the graves were unimportant; however, it may be interesting to note that small pieces of limestone (there is a singular absence of small loose limestones scattered here) with angles indicating that they must have been broken, showed unmistakable signs of disintegration, and this, with but slight if in some cases any exposure to the air.

An expedition made to the Agua Que Suena region was undertaken. The mountains separating Tenango from Chilchotla were crossed; the river was passed with but little of interest being encountered. The Chilchotla ruins were evidently nearer the plantations which we could barely see in the distance.

A peculiar spindle, the only one of its kind, was found. In general form and details it is lighter and more elaborate than the common spindle in use at the present time. Red clay was used in manufacturing; all red pottery is rare in Tenango.

To the hurried traveler it may seem that the Mazatecs bind their heads as Professor Star states in his ethnography of these people; this, however, is not the case. The occiput is certainly not deformed by artificial means as the Professor seems to think, nor does head binding seem to have been an ancient custom of these people. The skulls examined from the Ayautla caves and Tenango showed no such indications but were well formed and natural in shape.

Ayautla at the present day is a small village built at the foot of Cerro Rabon. In the material used and the type of the dwellings it differs slightly from the other Mazatec pueblos. Numerous limestone walls are to be seen running in and around the village. These walls have probably been there since the place was first settled, but the only object that could have caused their building seems to be the clearing of the streets of limestone rocks which are very plentiful. As already said, the ancient site of the town is further North, the foundations of the houses are numerous, and the exposed limestones are blackened with age. Being viewed from the road, it is impossible to say much about them, though doubtless they have been built at different times.

Several parts of the Mazatec country show, if not the actual occupation, at least the influence of the Zapotec and Aztec peoples. The rocky region of Tenango is perhaps the least affected by these higher civilizations, and in reaching this conclusion I take as a clue the character of the country.

LOUIS N. FORSYTH.

New Iberia, La.



BOOK REVIEWS

THE SEA-KINGS OF CRETE¹

IN this very attractive volume, the author has presented a story of the result of recent exploration in the island of Crete which will be amazing to most persons who have not closely followed that work. The general public has believed that the history of the beginnings of Greek civilization was virtually told by Homer. But these investigations show that 2,000 years before Homer wrote, a high civilization flourished in Crete. The present generation has been one of great discoveries both in Mesopotamia and Egypt, but the astounding facts disclosed both at Nippur and Abydos have been fully equalled by Schlieman's discoveries at Troy, Mycenæ and Tiryns, and later still by these in Crete carried on by Italians, Englishmen and Americans.

Greek history as we have generally considered it began about 776 B.C. while everything before that belonged to the age of myth. The point at which fact began and myth retired has not yet been determined, nor will it probably ever be exactly determined, unless a key to the ancient script of Crete shall be found. In the period between 1873 and 1890 when the treasures of Mycenæ were disclosed it became evident that even that glorious period was only a survival of a still richer past which had its source and home in the island of Crete, and there are found the foundations of many legends which have formed so attractive a part of Greek literature. The Cretans claimed that it was on their island that Minos was buried, and it was this claim which gave them their reputation for falsehood which clung to them so long and was even mentioned by St. Paul.

A large number of legends gather about the name of Minos, and Professor Murray has plausibly suggested that it was a title rather than an individual name, as Caesar and Pharaoh were used by different members of the families. Thucydides speaks of Minos as being the first person who saw the advantage of a navy, and by its use scoured the sea of pirates and saved for his own provinces the revenue. But we are not left entirely to surmises in the matter, for: "Each of the Minoas which appear so numerous on the coast of the Mediterranean, from Sicily on the west to Gaza on the east, marks a spot where the king, or kings who bore the name of Minos once held a garrison or trading station. Their number shows how wide-reaching was the power of the Cretan sea-kings" (p. 10).

It is a fascinating record of legend and fact which opens up before us,—the story of the labyrinth, and that of Dædalus, to whom has been ascribed the invention of the auger, the wedge and the level. He it was who first made the labyrinth and was said to have been imprisoned in it afterwards. It was to escape from it that he constructed the first airship, propelled by

¹ *The Sea Kings of Crete*, by Rev. James Baikie, F.R.A.S., with 32 full page illustrations from photographs. Pp. xiv, 288., octavo. London, Adam and Charles Black, 1910. Imported by Macmillan Co., New York.

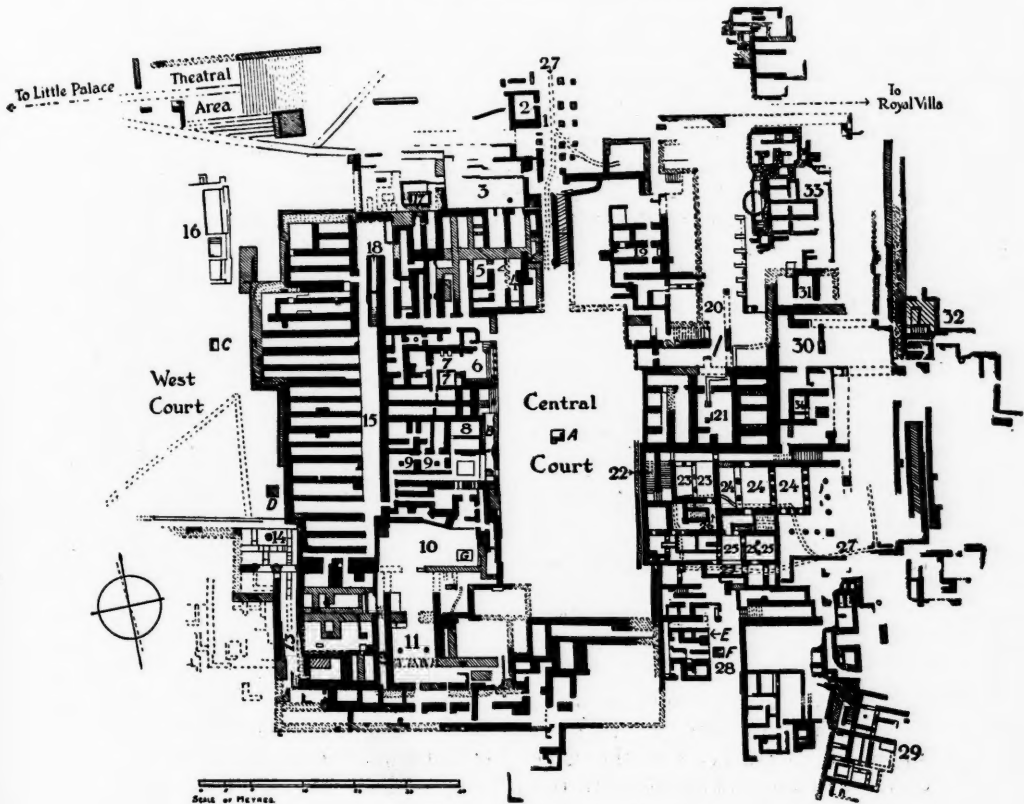
wings fastened on by wax, of which we read early in our studies. All of these stories help us to believe in an older civilization than that of which Homer writes, and from which the Greece of history has derived many of its traditions. "Crete sends 80 ships to the Achaean fleet at Troy,—100 cities says the *Iliad*; 90, says the *Odyssey*."

One noticeable fact comes out in the Homeric poems, namely, that woman then held a position equal to that which she occupies today. The names Penelope, Andromache and Nausicaa all show this to any one familiar with their stories, while in historic Greece women were thrown into the background as in all eastern countries.

From this aspect of the case we turn to the material where we find descriptions of at least three palaces of great splendor; even though in one of them Princess Nausicaa did oversee the family washing, and though Odysseus appears as a good ploughman and shipwright. This attention to detail work was also shown in their elaboration of metal work, as, for instance, the ornamentation of the shield of Achilles.

In 1895 Dr. A. J. Evans bought a part of the site of Kephala and from that time interest in the explorations grew. His attention had been drawn to Crete by the sale in Athens of some seal stones found in the island. These were engraved in characters entirely different from the Egyptian or Hittite characters. The Doctor hoped he might discover the key to the ancient Cretan writing, for he remembered that there had been a tradition in the island to the effect that the Phoenicians had not invented letters, but had only changed the form of those already in use. He began explorations in central and eastern Crete, and very soon began to find evidence of the presence of such script. This was "especially true in the Dictaeon cave where a stone libation altar was found inscribed with a dedication in the unknown writing." Dr. Evans still held to the idea that at Knossos would be the most valuable finds. But it was not until 1900, in March, that he began exploration at that point. Then he employed from 80 to 150 men until June. Not even Schlieman's labors at Troy and Mycenæ were better rewarded. In a short time he had uncovered two acres of the foundation of a huge pre-historic building, and it was at once seen to be part of a palace. All over the space "neoliths" were found, sometimes buried to a depth of twenty-four feet, indicating a long occupation in pre-historic times. The author says: "But the neolithic deposit was not the most striking find. On the southwest side of the site there came to light a spacious paved court, opening before walls faced with huge blocks of gypsum. At the southern corner of the court stood a portico which afforded access to this portion of the interior of the palace. The portico had a double door whose lintel had once been supported by a massive central column of wood. The wall flanking the entrance had been decorated with a fresco, part of which represented that favorite subject of Mycenæan and Minoan art,—a great bull; while on the walls of the corridor which led away from the portal were preserved the lower portions of a procession of life-sized painted figures. Conspicuous among these was one figure, probably that of a queen, dressed in magnificent apparel, while there were also remains of the figures of two youths wearing gold and silver belts and loin cloths, one of them bear-

PLAN OF THE PALACE OF KNOSSOS.



From *The Sea-Kings of Crete*

ing a fluted marble vase with a silver base. At the southern angle of the building, this corridor—the 'Corridor of the Procession'—led around to a great southern portico with double columns, and in a passage way behind this portico there came to light one of the most fairly complete evidences of the outward fashion and appearance of the great prehistoric race which had founded the civilization of Knossos and Mycenæ. This was a fresco painting, preserved almost perfectly in its upper part, of a youth bearing a gold mounted silver cup (plate, vi.). His loin cloth is decorated with a beautiful quatrefoil pattern; he wears a silver ear-ornament, silver rings on the neck and upper arm, and on the wrist a bracelet with an agate gem." Thus "for the first time the true portraiture of this mysterious Mycenæan race rises before us The profile of the face is pure and almost classically Greek."

The southern portico led again to the central court adjoining which were magazines containing immense jars for corn and oil. These had all been



THEATRICAL AREA, KNOSSOS; RESTORED

From The Sea-Kings of Crete

rified at an early period. From this court again we come to "two small rooms connected with one another, in the center of each of which stood a single column marked with the sign of the double axe. They were apparently sacred emblems connected with the worship of a divinity, and the double axe markings pointed to the divinity in question. For, the special emblem of the Cretan Zeus (and also apparently of the female divinity of whom Zeus was the successor) was the double axe, a weapon of which numerous votive specimens in bronze have been found in the cave sanctuary of Dicte, the fabled birthplace of the god. And the name of the double axe is Labrys, a word found also in the title of the Carian Zeus, Zeus of Labraunda" (p. 70).

All this proves conclusively that this palace was the labyrinth which Dædalus is supposed to have built for his master. As one goes along the wall of the central court he reaches an ante-chamber which opens into another room. On the walls of this, frescoes begin to come out, pictures of griffins with peacock plumes adorn the entrance, and the side walls are decorated with flowering plants and running water. Here was evidently the heart of the palace—the council chamber—with a great seat composed of blocks of gypsum. The strangest part of it all is that the lower part of this seat is supported by an arch which is very suggestive of the Gothic arch. This is in all probability the oldest throne in the world. Here were found fragments of its former decorations—blue and green porcelain, gold-foil,

lapis lazuli and crystal. An agate plaque bore a relief of a dagger laid upon a folded belt, which was almost like a cameo in its beauty. In another room near this central court was found the fresco of "A Little Boy Blue." Even his flesh tints were blue, and he was picking white crocusses and placing them in a vase. The descendants of those same crocusses still dot the meadows of Crete to-day.

On the northern side of the palace was another portico, and it was here that they found the miniature frescoes showing the details of dress of this early people. It was here that the pictures of women with the fair complexion were first seen whose costume was the evening dress of the present time—low necked gowns, slender waists, hair elaborately curled and dressed.



GOLDSMITHS' WORK FROM BEEHIVE TOMBS, PHÆSTOS

From The Sea-Kings of Crete

On the north side was the real entrance, approached by a road leading direct to the harbor, three and a half miles distant. The road thither, and in fact all their roads, were even better made than the Roman roads. Here one very strange fact forces itself on the student, namely the lack of all adequate fortifications. This can be accounted for only on the supposition that peace ruled at that time on the island and no organized warfare was to be feared. This was doubtless due to the fact, before referred to, that Minos had first seen the advantage of a fleet, and by providing one had made his country safe and peaceful—an argument which our advocate of large navies might quote effectively; for, from the evidence, we learn that at last this navy was overcome and with it the kingdom's supremacy. Near this north

entrance was found the greatest artistic treasure—a plaster relief of a bull's head. "It is life size and modeled in high relief. The eye has an extraordinary prominence. Its pupil is yellow and the iris a bright red of which narrower bands again appear encircling the white toward the lower circumference of the ball. The horn is grayish blue."

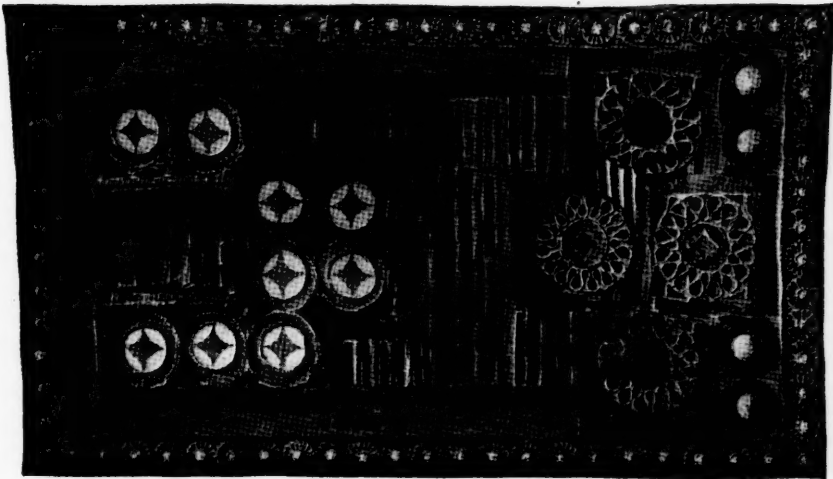
We have already referred to the finding of clay tablets some of which had evidently been baked by the fire which destroyed the palace. Here lies a theme for the student. Should some key to this script be discovered what secrets might not be unfolded. So it was proved that Dr. Evan's prophecy was correct, showing that Greek letters went back at least seven centuries beyond the first known historic writings. Here was found also the first evidence of communication between Crete and Egypt. The evidence is a part of a small diorite statuette of Egyptian workmanship, with an inscription in hieroglyphics which reads "Ab-nub-mes-Sebek-user maat-kheru" (Ab-nub's child, Sebek-user, deceased).

Still east of this central court was a mass of buildings constructed so upon the side hill that story upon story emerged, these being connected by a fine stairway, of which thirty-eight steps still remain. In one of these lower levels they came upon a large colonnaded hall and "adjoining it was the hall of double axes already referred to (plate 17), 80 ft. by 26, and divided transversely by a row of square sided pillars." All these rooms showed evidences of fire, and in one room, evidently a sculptor's studio, the artist had been engaged in carving a stone vase, for it was only begun, while near at hand stood a beautifully finished one 27½ in. in height and with a girth of six feet eight and three-fourth inches. Near here also was magnificent gaming board, which Professor Burrows says defies description, with its blaze of gold and silver, ivory and crystal.

The following season's work disclosed frescoes showing the darker side of the life—the bull fight, in which girls as well as boys took part. There are innumerable representations of this cruel sport, in which the human victims must have been numerous. These probably were prisoners, for later discoveries showed deep pits lined with smooth masonry which were evidently dungeons, from which captives were taken to the ring. The figure of Little Boy Blue gathering crocusses in the meadow is almost directly above some of these horrible pits. Again, connection with Egypt was found in the lid of an Egyptian alabastron near a bath room, on which was the cartouche of a king which reads "Neter nefer S'user-en-Ra, sa Ra Khyan." "These are the names of one of the most famous kings of the enigmatical Hyksos race—Khyan—the Embracer of the Lands as he called himself." In the British Museum is found one of his cartouches carved in granite which was found as far east as Bagdad. The statuette referred to before shows that the Minoans had communications with Egypt at the time of the Middle Kingdom. This goes to show that they were also in some sort of communication during the dark period of Egyptian history, between the fall of the Middle kingdom and the rise of the empire. Other vessels show a still earlier connection, even as far back as the early days of the early kingdom in Egypt. Among the finds may be noted a clay matrix showing that attempts had been made to counterfeit. Was not Solomon right when he said "there is nothing new

under the sun?" Beautifully carved ivory figurines were also found in a side room which were wonderful in the delicacy of the carving and in the accuracy of detail (plate 19). The plaques which once adorned a dower chest represent houses of two and three stories of good proportions even as measured by houses of well-to-do people of today. At Gournia, Mrs. H. B. Hawes unearthed a town showing practically just such houses, and here we are confronted with the fact that this ancient people had grappled with the drainage question and had worked out a system far surpassing that of Edinburgh at the end of the XVIII century.

The religion of this people would seem to have been symbolized by a snake goddess. Numbers of her figures were found; while near the supposed shrines of this goddess there was found the first cross made of veined marble. It had arms of equal length suggesting that the Greek cross of to-day is



THE KING'S GAMING-BOARD

From The Sea-Kings of Crete

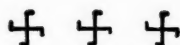
the oldest form of that symbol. Professor Burrows suggests that one of the discoveries in a long corridor divided by rows of columns present the first idea we have of the Roman Basilica. One strange fact came out, namely, that the plunderers had left almost no piece of metal work, although the art had long been known and practiced. Fortunately, however, one room had escaped, probably from the fact that the floor gave way before the plunderers reached it. Here were found five magnificent bronze vessels, four large basins and a single-handled ewer.

Referring again to the connection between Crete and Egypt, both Herodotus and Pliny tell us of a Labyrinth at the mouth of the Fayum built by Amenemhat which corresponds well with this palace at Knossos. The probability is that they were both of the same age. Certainly there is little to show that one is earlier than the other, and so far as known they are the only such structures ever erected. All this makes it probable, as our author

has conclusively shown, that active communication existed between the two countries. In fact he claims that there was a much more general inter-communication between all known countries of antiquity than had been supposed before, giving as another piece of evidence the fact that a piece of white jade, a stone peculiar to China was found on the site of the second city of Troy, and that city was probably contemporary with the early third Minoan period. At Gezer Tell-es-Safi, Aegean pottery was found. Dr. Evans also found a purple gypsum weight at Knossos which compared with the light Babylonian talent and the ingots of bronze from Hagia Triada, all representing the same standard weight.

From all the evidence it would seem that, as in the Egypt of Amenhotep III, luxury crept into the Minoan kingdom and decadence forthwith set in. Just when the great catastrophe came upon it we have as yet been unable to determine. From what we can learn from contemporary history it was about 1400, B.C. Evidently it was sudden and overwhelming. In this presentation of the facts so far discovered the Rev. Mr. Baikie has certainly done the reading public a great service.

FLORENCE B. WRIGHT.



LIFE IN THE ROMAN WORLD OF NERO AND ST. PAUL²

PROFESSOR Tucker has aimed, in this work, to lead the reader to visualize the Roman citizen of 64 A. D. as a human being. He has endeavored "to realize more veraciously what life in the Roman world was like." To accomplish this end, the author first portrays the general conditions throughout the Roman Empire and then turns to the consideration of the home surroundings of an individual, following him through his education, various crises and an ordinary day of social life and amusement. Chapters on *The Army, Study and Scientific Knowledge, Philosophy* and *Roman Profusion of Art* follow, helping to leave the reader feeling in closer touch with the contemporaries of St. Paul.

The exposition of the contemporary view concerning St. Paul is instructive:—"To the philosophers at Athens he appears as the preacher of a new philosophy, and they think him a 'smatterer' in such subjects . . . In his language they detected what seemed to be borrowed notions not consistently bound together, and they called him . . . 'a picker up of seeds'."

Concerning the persecution of the Christians he says:—"The early Christians were treated as they were, not because they held non-Roman views, but because they held anti-Roman views; . . . they appeared to convert men into dangerous characters. . . . The *intransigent* Christian refused to take the customary oath in the law courts, and therefore appeared to menace a trustworthy administration of the law. . . . He was a socialist leveler," and refused to acknowledge the statue of the emperor.

HELEN M. WRIGHT.

² *Life in the Roman World of Nero and St. Paul.* By T. G. Tucker, Professor of Classical Philology in the University of Melbourne. Numerous illustrations; 3 maps. Pp. xix, 453. \$2.50 net. The Macmillan Co., New York. 1910.

EDITORIAL NOTES

GIFT FOR GUATEMALA EXPEDITION.—A gift of \$7,500 has been made to the School of American Archæology, to aid in the expedition to Guatemala which is expected to take the field this winter.

TO REPAIR THE BALCONY HOUSE.—The Smithsonian Institution and the Colorado Cliff Dwellings Association have asked the School of American Archæology to take charge of the excavation and repair of the Balcony House in the Mesa Verde National Park. Director Edgar L. Hewett, Jesse L. Nusbaum, P. J. Adams, and Lewis B. Paton will have the management of the work.

DAMAGE TO CLEOPATRA'S NEEDLE.—Cleopatra's Needle on the Thames Embankment, London, has been so much damaged by the weather that it is proposed to remove it to some sheltered place. The obelisk in Central Park, New York, has been protected by a coating which preserves the surface, although it stands in the open air.

MUMMY OF THE RED SEA PHARAOH.—According to the New York *Times* a mummy discovered some years ago at Thebes in the tomb of Amenophis II proves to be that of Menephtah, the Pharaoh during whose reign the Exodus of the Israelites took place. His face bears striking resemblance to that of his grandfather, Seti I. The body had been carefully embalmed and showed evidences that the Pharaoh died a natural death.

MARKING THE SANTA FÉ TRAIL.—The legislature of New Mexico at its last session appropriated \$600 to assist the Daughters of the American Revolution in erecting markers along the route of the old Santa Fé trail. This will provide for a granite marker with inscription for each 10 miles of the trail from the Colorado line to Santa Fé. The marker nearest the county seat of each county traversed is to be larger than the others. The stones are to be set in cement bases. The counties have been asked to set these up at their own expense, all other expenses being borne by the Daughters of the American Revolution and the appropriation.

TEXTS FOUND BY DOCTOR STEIN.—"Among the texts in an unknown tongue lately brought back from Tun-huang by Doctor Aurel Stein and handed over to Doctor Hoernle for examination, were two Buddhist canonical texts of Sutras, in one of which he recognized the 'Aparimitayuh Sutra,' of which there is a copy in Calcutta and another in Cambridge, both written in Sanskrit and found in Nepaul. As these texts contain a number of mantras or spells together with rubrics or directions for their use, which, in Doctor Stein's text, are given in the unknown tongue, we should have here a bilingual that ought to give us the key to the mystery. Various discoveries in this region are linking themselves together and will in time probably fill up a gap in the world's history."—[London *Athenæum*].

PLEISTOCENE CLIMATE IN FRANCE.—M. A. Laville in a recent communication to the Society of Anthropology of Paris raised doubts as to the presumed heat of the climate in the region of Paris in the Pleistocene period. Explorations near Paris form the basis for his opinions.

TO EXCAVATE CYRENE.—A firman has been granted to a representative of the Archaeological Institute of America for the excavation of Cyrene. Such excavations were proposed early in the history of the Institute by Professor Charles Eliot Norton, but conditions have only recently become favorable. Funds to the amount of \$15,000 a year for 3 years have been pledged by members of the Institute for the early stages of the work. Allison V. Armour, of New York, Arthur Fairbanks, of the Boston Museum of Fine Arts, and D. G. Hogarth of the Ashmolean Museum, Oxford, constitute the committee to direct the undertaking.

The ruins are covered with soil to only a moderate depth. The site has been protected by its inaccessibility, and has been uninhabited for centuries. It seems likely that much of human interest will be revealed by the excavation of a few ancient sites.

SYLLABARIC INSCRIPTIONS FOUND ON CYPRUS.—On September 10, 1910, the Greek schoolmaster at Kouklia, Cyprus, discovered an accumulation of Cyprian syllabary inscriptions not far from the town. The next day he revisited the spot with Mr. Peristanis, honorary custodian of the Cyprus Museum, and in a short time picked up 34 stones bearing inscriptions. The character of these inscriptions differs widely from that of those found at Rantidi not far away. These stones from near Kouklia—the locality is called Tshira Philippa—are evidently hundreds of years younger than those from Rantidi, and are not incense basins as are the latter. Their character is similar to that of the 3 Cyprian syllabary inscriptions which were found in 1882 at the courtyard of the Aphrodite Astarte Paphia temple at Kouklia, which are not older than the IV century B.C. It seems likely that further investigation would reveal much of interest at Tshira Philippa.

POTTERY FRAGMENTS FROM PITS AT PETERBOROUGH.—Pottery fragments from the prehistoric pits at Peterborough were recently exhibited to the Society of Antiquaries [London]. These pits were of two kinds: small steep-sided with flat bottoms, or large and shallow with pointed or flat bottoms. The latter are saucer-shaped like hut-circles. They are $3\frac{1}{2}$ or 4 ft. deep and 10 or 12 ft. in diameter, and are filled with reddish loamy gravel above a greyish layer at the bottom. The smaller ones contain flint implements, charred wood, pot-boilers and other traces of fire. The lowest level yielded thick brown ware, ornamented outside and within the lip—round-bottomed bowls of the Neolithic type. Above this line, many pieces of "drinking-cups" were present, better made, corresponding to the earliest pottery of the round barrows. The nearest parallels on the continent to this thick ware are in Finland. The beakers were later, but possibly overlapped in time. They are similar to types on the Middle Rhine. This was the first important find of beakers as domestic vessels in England,

although there had been similar discoveries in Hadingtonshire. The absence of metal suggested the age as previous to the Bronze Age.

ANNUAL EXHIBIT OF EGYPT EXPLORATION FUND.—The Egypt Exploration Fund held its annual exhibit at King's College, in the Strand, London, during July. The results of Professor Naville's work during the past season at Abydos were there presented. One of the features was a perfect female skeleton from a predynastic grave, which was shown in a box of sand in the position in which it was discovered, with a red vase of the black-topped kind in front of her face. The most important part of the exhibit contains the objects found at Omm-el-Ga'ab, or the Royal Tombs. Among these were 3 painted mud figures of Osiris in mummy form. There were many jar-sealings from the tomb of Perabsen of the II or III dynasty, and flint knives of unusual shape and a curious instrument of flint with two sharp cutting edges like a fishhook. The use is unknown.

Work was also carried on in another cemetery, where a set of instruments used in the mystic ceremony of "Opening the Mouth" of the dead was found. The pottery board with holes for the various instruments shows the small jars of black and white stones and black and white knives. One water jar has been replaced by a jar from a smaller set; another instrument, the pink stone *pesh-en-kef* is wanting. This set seems to be from the VI dynasty.

SUMMER SESSION OF SCHOOL OF AMERICAN ARCHÆOLOGY.—The summer session of the School of American Archæology held in the Rito de los Frijoles Canyon during the past summer came to a close in September after the meeting of the regents of the New Mexican Museum, which was also held in the Canyon. At the meeting of the regents, over which Judge John R. McFie presided, plans were discussed and the work accomplished was reviewed. Among the gifts acknowledged was half of the Guatemala collection made at the expense of the St. Louis society.

In the forenoon before the business meeting, the regents, staff, students and visitors made a tour of the caves, cliff and communal houses—from the cavern in which the mummy of a young girl wrapped in cloth rests as it was found, to the ceremonial cave. The caves are well preserved. In the stone floors are still embedded the willow loops which were part of the ancient looms. Interesting pictographs appear on the cliffs.

The canyon—its name means Little River of the Beans—is enclosed by high walls of rock and is accessible only by a steep foot trail. The houses along the cliff were in good condition, needing only clearing and slight repairing. At the foot of the cliff is a circular ruin, called Tyuonyi by the natives, which is now about half uncovered. It appears to contain as many as 250 rooms. A layer of 4 or 5 ft. of alluvial soil covers the ruins. If, as has been suggested, this is a wind deposit, the ruins must be very old. Many rare specimens have been found and transferred to the museum at Santa Fé. Much glazed pottery was found, proving that the inhabitants knew how to glaze their ware.

The ceremonial cave at the western end of the settlement has been restored. Ladders and stairways have made it accessible to the visitors.

It had two floors, between which were corn husks and charred corn together with stone and bone implements.

The students of the School were fortunate in being able to combine the theoretical and practical side of their studies in such surroundings. Many chose to sleep in the cliff-dwellings themselves, while others used tents or slept in the open. Lectures were given in the evening on the work of the day.

As a realistic climax to the summer's work, on the evening after the regents' meeting the whole cliff was illuminated by bonfires on top and candles in the cliff-houses while some 15 of the Indian workmen performed the Eagle, Dog and Sioux Scalp dances in the courtyard of Tyuonyi.

INTAGLIO MOUNDS OF WISCONSIN.—The January-April, 1910, issue of the *Wisconsin Archeologist* contains an article by Charles E. Brown on "The Intaglio Mounds of Wisconsin." Sixty years ago Doctor I. A. Lapham described and figured 9 of these interesting earthworks. All but one have now disappeared, though another was barely discernible as late as 1907. All seem to have been effigies of the "panther" type. They were always near other aboriginal earthworks. As the name implies, they were excavations rather than true mounds. The dirt dug out was piled up around the edges, helping to emphasize the outline.

The only intaglio mound known to exist at the present day is about one mile west of Fort Atkinson, Wisconsin. "It is a monument of such character that one does not contemplate it without being stirred by a deep interest in its hidden significance and in its prehistoric Indian authors. It lies today upon a fine carpet of greensward, and is headed toward the west, its great depressed body paralleling the road the two rounded hollows which represent its limbs reaching to within a few feet of its edge. From its western extremity the best view of it is obtained. With the exception of a small portion of the tip of the tail, which has been disturbed by the plow, every portion of the figure is apparently as well defined as when first viewed by its discoverer more than a half century ago.

"Its greatest depth (at the middle of the body) is slightly over two feet. The great tail of the animal reaches to within about 25 ft. of a fine, large conical burial mound. The mound is at the present time about 50 ft. in diameter and about 4½ ft. high. It has been plowed over several times in the past and is reported to have been previous to that an even more conspicuous monument than it is today. It and the intaglio are the only two earthworks which survive of the interesting group once located at this place. Remnants of one or two others remain along the roadside on the neighboring properties. Every trace of the others has now disappeared. The needless destruction of some of these is due to a lack of intelligence and of public spirit on the part of their owners."

In 1905 the Fort Atkinson Chapter of the Daughters of the American Revolution leased the property to preserve the intaglio. Later the lease was renewed for one year, but in 1910 the owner refused to renew, and therefore a movement was set on foot to arrange for its purchase and permanent preservation. A considerable sum has already been subscribed for the purpose.

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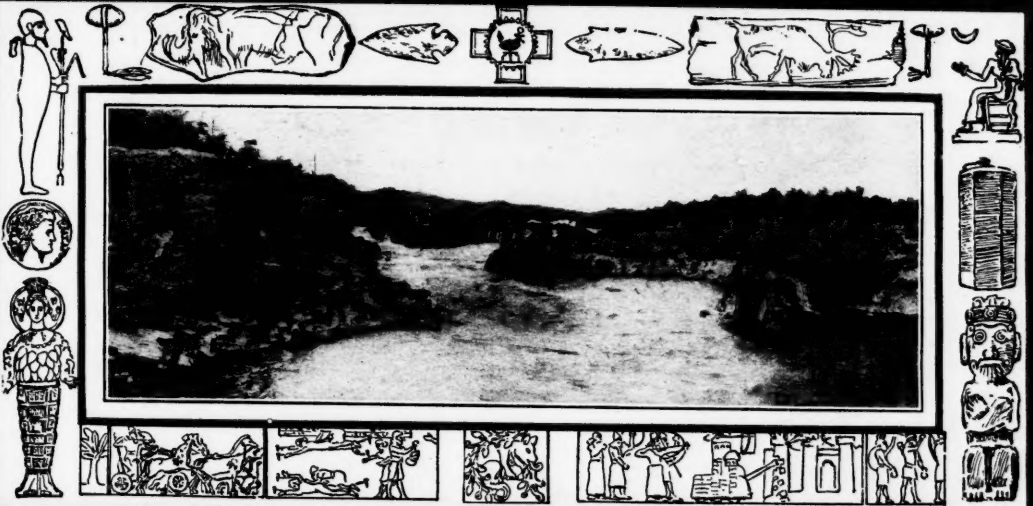
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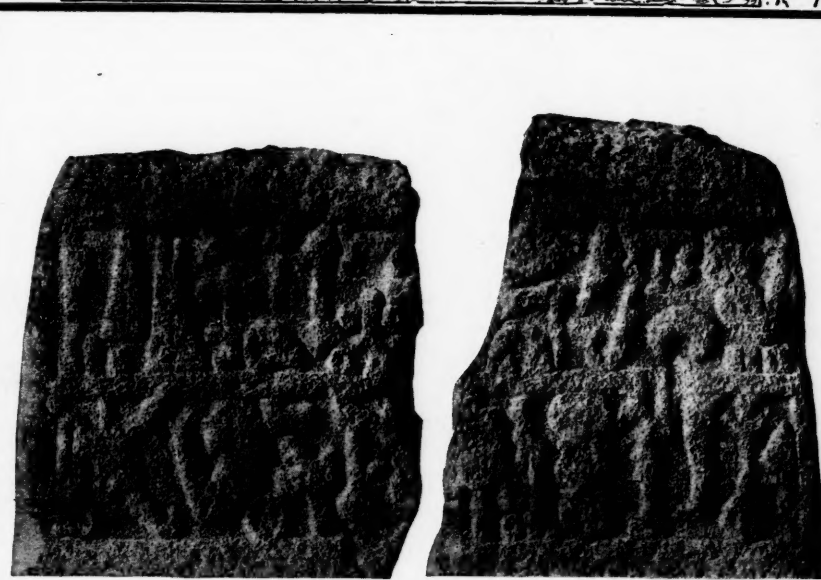
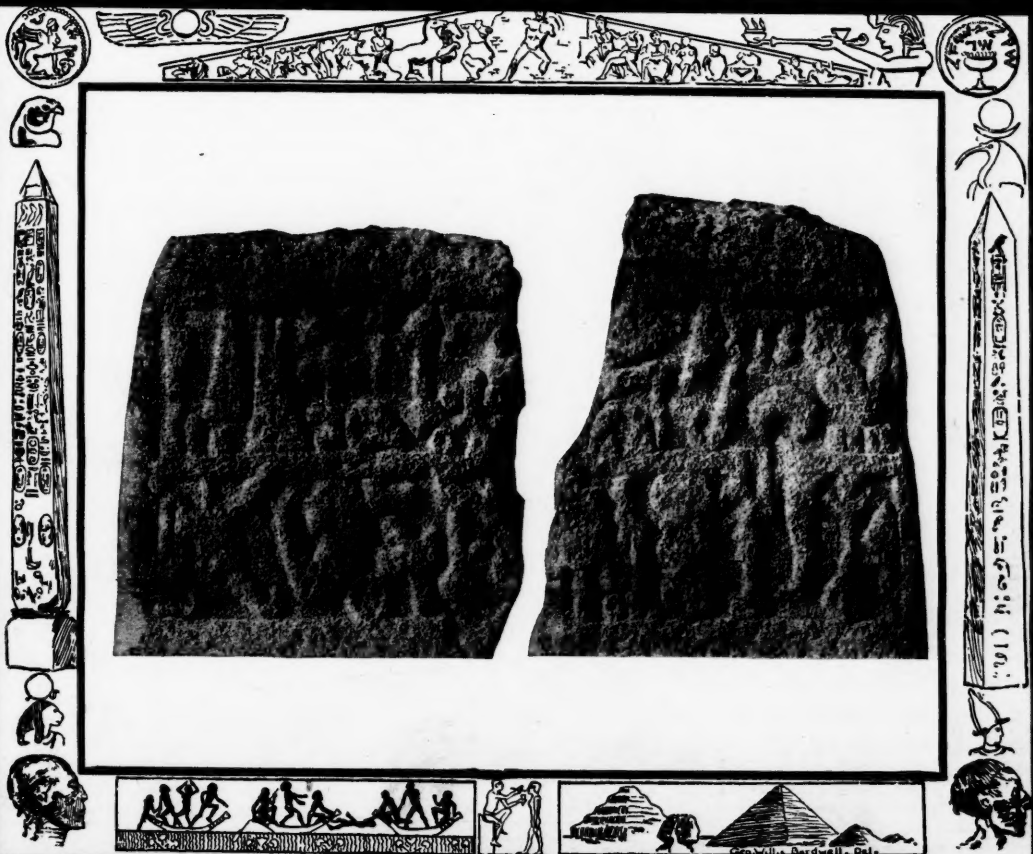


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VOLUME IX

MARCH-APRIL, 1910

PART II



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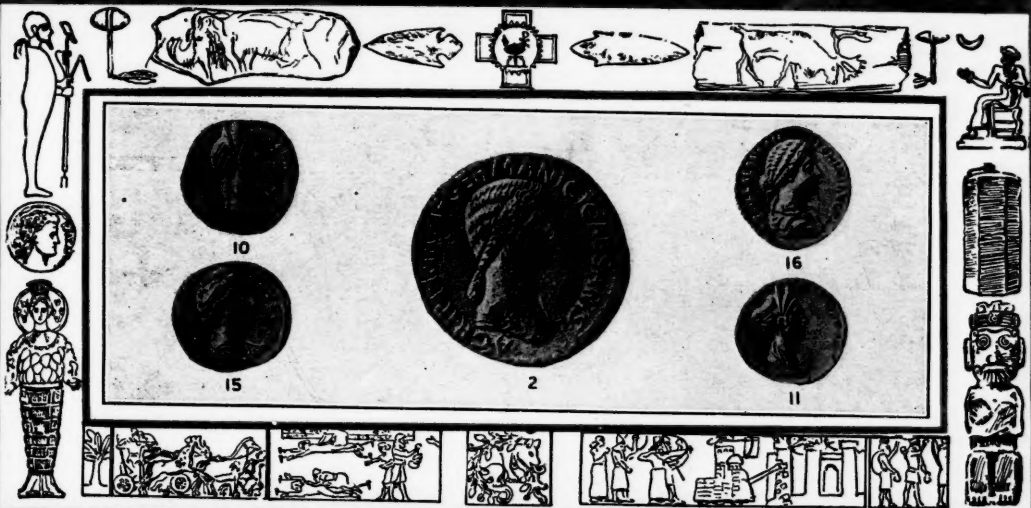
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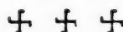


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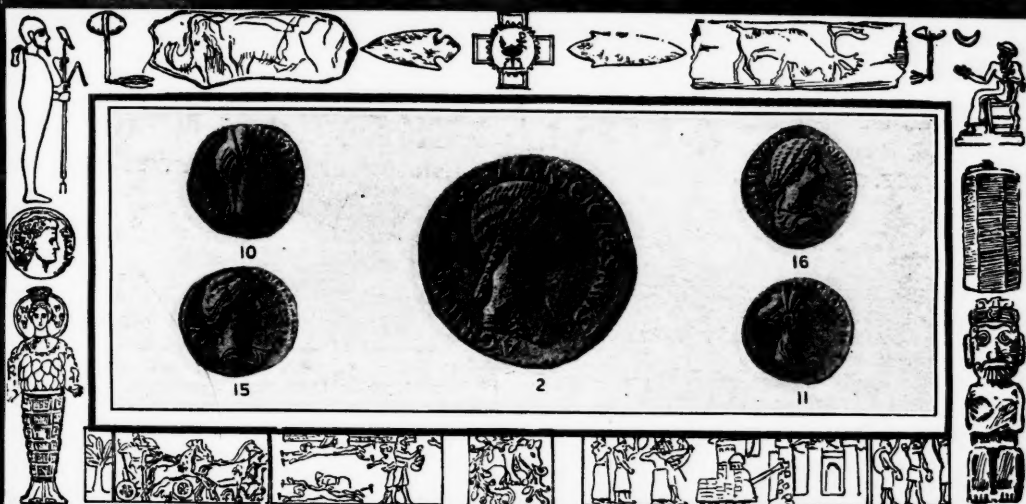
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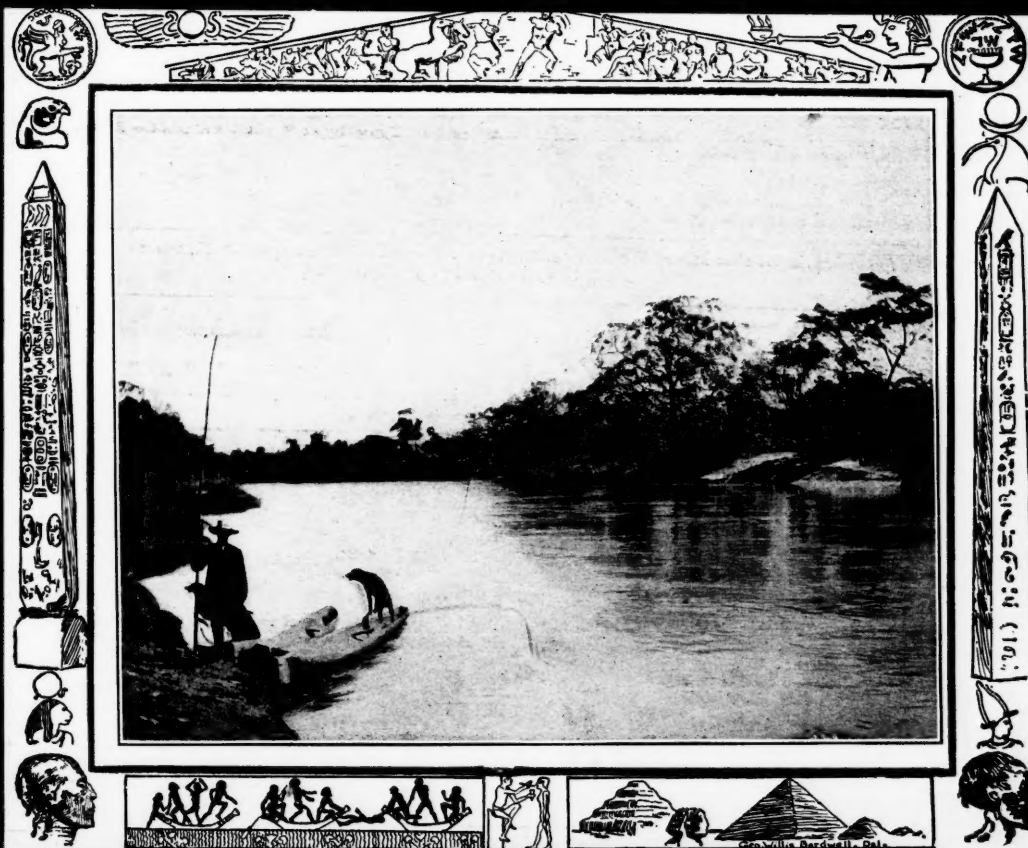


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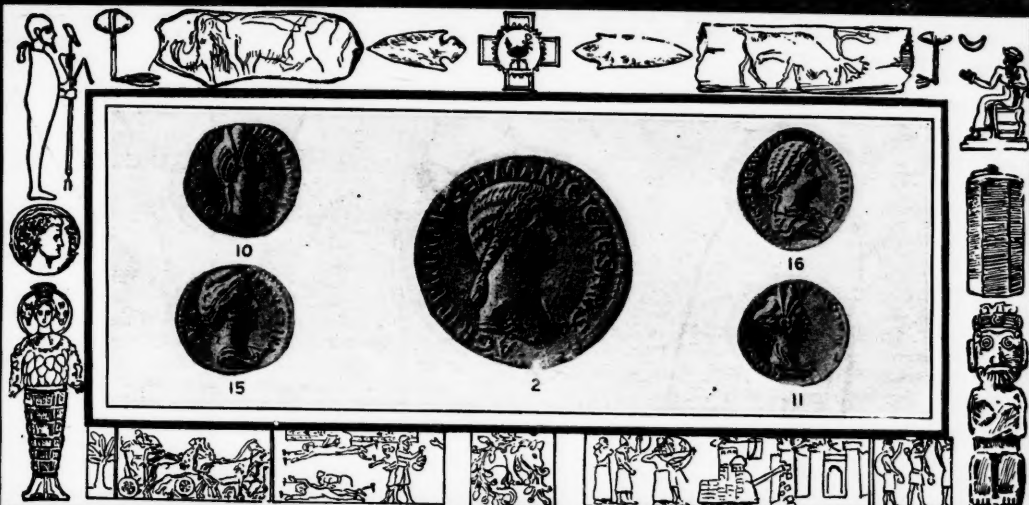
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